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PETROLEUM:

PETROLEUM *vs.* COAL FOR GENERATING STEAM

BY PROF. R. A. FISHER.

Gentlemen,—I herewith submit a report of a series of experiments, made at your request, with the apparatus of Mr. G. Hill, No. 606 Ninth avenue, New York, to determine the value of petroleum as a fuel, when its vapor is burned in presence of steam, by the method devised by Mr. Hill.

The value of any fuel, liquid or solid, depends upon its heat-giving power—the quantity of heat it evolves during the act of burning. This can be determined by three methods: 1. By the system of Lavoisier and La Place, in which the substance is burned in the centre of a vessel, the walls of which are lined with ice—the quantity of ice melted measuring the heat disengaged 2. By the "Calorimeter" of Watts and Rumford, in which the degree of heat communicated to a given quantity of water indicate the amount of heat produced. 3. By the quantity of water *evaporated* at a given temperature by a given weight of fuel.

It is now the usual custom, in making experiments upon the calorific power of different fuels, to follow the second or third method, or a combination of the two, *i. e.*, with a given weight of fuel, to heat in a boiler to 212° F., or a higher temperature, a known quantity of water, and afterward to convert as much of this hot water as possible into steam.

The amount of heat required to raise a gallon of water from 60° to 212° F. (its boiling point,) or to convert an equal quantity of boiling water into steam at the same temperature, has been accurately determined. Experiment proves that the heat requisite to raise 6.36 gallons of water from 60° to 212°, is sufficient to convert only one gallon of boiling water into steam; but if water be heated in a closed vessel from 60° to 268° (until a pressure of 40 pounds to the square inch be produced), the heat required to raise 4.38 gallons to 268° will convert one gallon of this water into steam of the same temperature.*

With these figures it is an easy matter to calculate the amount of heat produced by the burning of any fuel, whether the heat be employed to warm a given quantity of cold water, to convert boiling water into steam, or, combining these operations, to elevate cold water to the boiling point, and afterward convert a portion or all of it into vapor.

In former years, the effect of a given quantity of coal or other fuel, was estimated by the performance of an engine supplied by the steam produced. But this method complicates the question of the *production* of steam with its *application*. The practical question of the comparative value of any fuel, is answered most simply and satisfactorily by ascertaining the quantity of water that can be evaporated by a given amount of such fuel, when burned to the best advantage.

This was the object in view when undertaking the experiments now to be described, made in a locomotive boiler of the following dimensions:

* This calculation is based upon the figures given by Regnault (967.5 degrees F.), for the "latent heat" of steam, and assuming the sum of the latent and sensible heat of steam to be the same (1179.5 degrees) at all temperatures; though Regnault has proved that this rule is not absolutely correct, the variation from it is too small to be here taken account of.

Inside length	46	inches.
" diameter	24	"
Dome	10	" high.
	12	" diameter.
Fire box	16 x 24	inches.
Diameter of flues	1¾	inches.
Length of "	24	"
Number of "	20	

Evaporating surface at 1st cock, 19 x 46=874 sq. inch.
" " 2d " 21 x 46=966 " "
" " with 2 gallons of water above 1st cock, 922 " "

Capacity of the boiler to 1st cock .....40.5 galls.
" " " 2d " .....50.75 "

The apparatus of Mr. Hill, employed in the experiment of burning the vapor of crude petroleum with steam, consists essentially of a copper "retort," connected with two "feeding pipes" and a series of seven iron tubes, each furnished with there bat-wing burners. The whole arrangement is fitted into the fire-box of the boiler. The "feeding pipes" are of wrought iron (1 inch in diameter and about 50 inches long,) bent in an S form, and connected with the "retort" in a horizontal position. One pipe communicates with the "petroleum can," the other with the boiler. These feeding pipes are furnished with rotary valves, by means of which the quantity of petroleum or steam let into the "retort" can be regulated at pleasure. The "retort" is a box, made of ¼ inch thick copper, 17 inches long, 2⅝ inches deep, 5½ inches wide, outside measurement. When about to operate with this machine, the "retort" is heated to a greater or less degree, by wood or other material, and petroleum is allowed to flow into it. Here this substance loses the liquid form, and mixing with steam, (let in simultaneously by the "steam feeding pipe,") passes into the seven wrought iron tubes, (1 inch diameter and 16¾ inches long, arranged in a gridiron form,) and thence to the twenty-one burners, at the points of which the combustible material is inflamed.

The experiments with this apparatus were thus conducted. Water was let into the boiler up to the "first cock"; this was then closed, and two gallons more of water added. With these 42.5 gallons in the boiler, a fire was kindled by wood moistened with petroleum. As soon as the "retort" was thought to be sufficiently hot, the petroleum was permitted to flow into it, and here the vapor, as fast as produced, was mixed with air supplied by a "blower." When a sufficient "head of steam" had been raised, the blowing was discontinued, and steam introduced into the "retort" instead of air. The evaporation of the water in the boiler was then allowed to proceed (under pressure of 40 pounds to the square inch,) carefully noting the quantity of petroleum run into the retort during every thirty minutes, and the time required to evaporate two gallons of water, as determined by the period between pumping this quantity into the boiler, and the falling of the contents of the same down to the first cock.

After continuing the observations for several hours, the supply of petroleum was cut off, the steam-valve opened, and fifteen hours afterward, when the contents of the boiler had cooled to the ordinary temperature, water was pumped into it from the tank, and the quantity required to bring the level to the first cock carefully noted. By this means was accurately ascertained the total quantity of water evaporated, as well as the amount of petroleum consumed.* But, as the material used for heating the tubes and retort before the steam was "up" was not weighed, as the petroleum did not burn quite as advantageously during the early stages of the experiment as afterward, and as no correct estimate can be made of the effect of the blower, nor, (owing to expansion,) of the amount of water evaporated before the contents of the boiler first fell to the lower cock, the figures thus obtained give but an approximative result. The exact amount of water evaporated by a given quantity of the petroleum, is, however, indicated by the following figures, obtained an hour after the consumption of petroleum and evaporation of the water were proceeding very regularly.

1st—2 gallons evaporated in			19	minutes.
2d—2	"	"	21	"
3d—2	"	"	20	"
4th—2	"	"	20	"
5th—2	"	"	21	"
Total, 10	"	"	101 min.—1.683 of an hour.	

In 105 minutes (1.75 of an hour) the quantity of petroleum run into the retort was 1.68 of a gallon, the flow being kept up as regularly as possible, and varying only a few hundredths of a gallon during every thirty minutes.

From these figures we obtain the following:

Quantity of water evaporated per hour, 5.95 gallons.
" of petroleum consumed " " .96 "
Hence, 1 gallon of petroleum evaporated 6.197 "

The petroleum used in the experiments was the "crude" article, of specific gravity 0.787 (48° Baum.,) and weighs 6.296 lbs. (6 lbs. 5 oz.) per gallon. Hence, 6.296 lbs. of the petroleum employed, evaporated 49.576 lbs. (6.197 gallons,) or 1 lb. of petroleum evaporated 7.81 pounds of water.

It now remained to determine the cost of generating steam with *coal*, in the same boiler, and at the same pressure. For this purpose, the apparatus of Mr. Hill was removed, and in its stead a grate (composed of fifteen rods, nineteen inches long, of five-eighths inch round iron, placed at the distance of three-eighths of an inch apart) was fitted into the fire-box.

The boiler was charged, as in the preceding experiment, with two gallons of water above the first cock, and the water-tank with 24 gallons. The fire was kindled with—

6 lbs. wood,
4 " charcoal,
40 " anthracite coal ("egg size.")

Depth of fire, 3—4 inches. An hour and forty minutes after "lighting up," steam commenced to "blow off," at a pressure of forty pounds to the inch, and during the next hundred minutes the water in the boiler was evaporated down to the first cock. The experiment was continued during four hours and thirty-five minutes, pumping in water as required (two gallons at a time, as in the petroleum trial) with charges, at first, of four pounds, and afterwards six pounds of coal, till a total of eighty-four pounds of anthracite had been put into the furnace. The fire was "drawn" thirty minutes after putting in the last charge, the "coals" quenched with water, screened,

* The petroleum was run into the retort, through the feeding tube, from a tin can, 18¾ inches high and 4⅝ inches in diameter, the quantity consumed from time to time being measured by a guage, graduated to read to the one hundredth part of a gallon. The water was supplied to the boiler by a force pump worked by hand, from a tank, accurately guaged, which, at the beginning of each experiment, was filled with 24 gallons of water.

and weighed. The weight of the unburned coal was thirty-two pounds.*

After cooling fifteen hours, water was pumped into the boiler to the first cock, and the total evaporation found to have been 26.5 gallons.

As previously stated, the heat required to raise 4.38 gallons of water from 60° to 268° will convert one gallon of water, at this latter temperature, into steam. Divide 42.5 (the number of gallons with which the boiler was first charged) by 4.38, and we have 9.7 gallons that would have been converted into steam at 268° by the heat required to raise to that temperature the contents of the boiler. This amount added to 26.5 gallons, gives 36.2 gallons of water, the total quantity convertible into steam, from 268°, by the amount of fuel employed:

Wood, 6 lbs, equal.....	2.4 lbs. coal.†
Charcoal, 4 lbs., equal ...	4.6 "
Coal actually employed ..	52.
	59.

59 lbs. of coal evaporated 36.2 gallons, equal to 289.6 lbs. 1 lb. coal evaporated from 268°, 4.89 lbs. of water. Considering the different calorific powers of different kinds of coal, these figures correspond much more closely than could have been expected with the quantity given by Mr. Wood in his treatise on railroads, in which he fixes 4.46 lbs. as the average quantity of water converted into steam by one pound of coal in locomotive boilers.‡

To proceed now to the comparative cost of generating steam by coal and petroleum, when the latter is burned according to Mr. Hill's method. Recapitulating, we have:

7.81 lbs. of water, at 268°, converted into steam by 1 lb. petroleum.

4 89 lbs. of water, at 268°, converted into steam by 1 lb. coal; or,

2,000 lbs. coal gave the same heating power as 1,252.2 lbs. petroleum.

With coal at ten dollars ($10) per 2,000 lbs., it would appear, from these figures, that petroleum of the quality used in the experiments just described, in order to compete with coal, must be furnished at ten dollars for 1,252.2 lbs., (198.69 gallons,) or at 5.02 cents per gallon. But if burned in the apparatus of Mr. G. Hill, it must be furnished at a still lower figure; for while with coal the whole amount of steam generated can be used to drive machinery, in Mr. Hill's apparatus, a large proportion of the steam produced is required to assist the combustion of the petroleum.

No experiments were made to determine exactly the quantity of steam thus employed, but from the fact that the coal evaporated but about four gallons§ of water per hour, while the petroleum evaporated about six gallons‖, without causing more steam to pass through the "safety-valve," we must infer that the steam produced from two gallons of the water per hour (or about one-third of the whole amount generated) passed through the "steam feeding-pipe" into the retort, and thence to the burners.

In view of all the facts elicited by these experiments, we cannot avoid the conclusion that the present prices of petroleum and coal, say coal at $10 per 2,000 lbs., and petroleum at 40 cents per gallon, the cost of fuel in Mr. G. Hill's process, of burning the vapor of petroleum in contact with "super-heated steam," is about ten times as great as when generating steam with coal.

Before closing this report, it may be well to remark, for the benefit of those who claim to be only practical men, that science clearly demonstrates the fact, that at the present relative prices of coal and petroleum, this substance can never be made to compete successfully with coal, as an economic fuel, let the mechanical arrangement for effecting its combustion be what it may. Human ingenuity has accomplished wonders—it has tamed the lightning, and rendered it subservient to the wants of daily life; it has taught the sun to sketch upon metal or paper with greater accuracy than the artists; it has converted mechanical force into heat, light, and electricity; it may accomplish still greater things than these, but it cannot change the laws of nature.

Experiment has fully established the fundamental law, that when a fixed quantity of a combustible substance is perfectly burned, the amount of heat disengaged is always the same. To burn perfectly a pound of carbon (the diamond) requires 2.666 lbs. of oxygen gas. The product of the combustion is carbonic acid, and during its formation there is evolved sufficient heat to raise the temperature of 77 lbs. of water from 32° to 212°. Similarly, a pound of hydrogen gas, in burning, unites with 8 pounds of oxygen, to form water, and the quantity of heat evolved will raise 344.62 pounds of water from 32° to 212°. These figures indicate the maximum amount of heat that can be produced by the perfect combustion of carbon and hydrogen, under any circumstances—the limit assigned by nature.

The above law applies equally to every combustible material, be it a simple body like carbon or hydrogen, or a compound; be it solid, liquid, or gaseous. The heat evolved by perfect combustion of a pound of absolute alcohol will raise from 32° to 212° 71.8 pounds water, while the same effect is produced upon 80 pounds of water by a pound of tallow.

These figures, obtained by MM. Favre and Silbermann, in their recent carefully conducted investigations, are the result of direct experiments, and accord perfectly with theory; and if petroleum were a homogenous compound,¶ with our present knowledge of the laws of heat and chemical combination, the amount of calorific that would be evolved during the perfect combustion of a given quantity of petroleum could be determined as accurately by calculation as by performing the experiment.

According to Mr. Tate, "the oils (petroleum) as found in nature, contain, as nearly as possible, an equal number of equivalents of carbon and hydrogen."* This would make the composition of crude petroleum nearly identical with oil of turpentine. MM. Favre and Silbermann, in their refined researches already quoted, found the heat evolved by the perfect combustion of 1 pound of turpentine to be sufficient to raise only 108.52 pounds water from 32°—212°. This, then, is about the maximum calorific power of crude petroleum—11.64 per cent. greater than that of anthracite coal†. Therefore, whether the perfect combustion of crude petroleum be effected by burning it directly, or after having converted it into gas; whether it be burned in the state of vapor alone, or mixed with air, or "super-heated steam," (as in Mr. Hill's apparatus,) or though the mechanical arrangement consists of "a series of corrugated recesses upon a vertical cone of cast-iron placed in the furnace," (as contrived by Messrs. Shaw & Linton), it is impossible to develop a greater calorific power than that with which it has been endowed by nature—that of heating about 108 times its weight of water from 32°—212°; a calorific power not quite 12 per cent. greater than that of anthracite coal.

It is therefore fallacy to suppose that, at the present relative prices of coal and petroleum, this substance, by any "improved method of burning," can be made to generate steam as cheaply as coal. Of the truth of this, science has already convinced those who have faith in her teachings; accurate experiment will, in due time, convince those who are satisfied only with tangible evidence.

Respectfully yours,
R. A. Fisher,
Analytical and Technical Chemist.

New Haven, Ct., June 1, 1864.

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* The heat contained in the coal drawn from the furnace was sufficient to raise the water used in cooling it from 65 degrees to 140 degrees; but the total amount was considered too small to enter into the calculation.

† *Vide* tables of heating powers of different fuels, given in *Ure's Dictionary*, vol. ii., pp. 259 and 300, last English edition.

‡ "Notes on the Use of Anthracite," by Walter R. Johnson p. 86.

§ Accurately, { 3,902 gallons (16 gallons in 246 minutes.) / 6,127 gallons.

¶ The composition of petroleum has been carefully studied by MM. Pelouse and Cahours, of France, and Mr. Schlorlemmer, of Owen's College, Manchester. Beside "paraffin" and alsphalte, they have already obtained no less than eleven different hybrids, forming a perfect "homologous series"; and Mr. Tate has discovered that "the wax called paraffin, instead of being one single substance, is a mixture of at least three or four solid hydrocarbons." *Vide Comptes Rendus*, LVI., p. 505; also, *Chemical News*, vol. VII., p. 197, and the number for July 25th, 1863, p. 44.

* "Petroleum and Its Uses." By A. Norman Tate, F. C. S., p. 40.

† MM. Favre and Silbermann obtained 108.52 and 84.60 as the relative calorific power of oil of turpentine and anthracite coal.

PETROLEUM REVIEW.

New York, June 30th, 1864.

Crude, for the past fifteen days, has been steady, with an advance of 3½ cents per gall. Sellers are firm, some of the heaviest houses holding it for 50 cents per gall. I notice the following sales for the past two days: 500 bbls. f. o. b., 40°a47° gravity, at 47 cents; 500 bbls. 40°a46° gravity, at 48½ cents; 325 bbls., same gravity, at 47½ cents; 2,000 bbls., to arrive, at 47½ to 49½ cents; also 500 bbls. for July, b. o., at 51½ cents; 500 bbls. July, 50a51½ cents; and 1,000 bbls. for August, at 52½ cents.

Refined in bond has greatly advanced since our last report—at least 10 cents per gall. The following are the latest sales: 275 bbls. light straw to white, at 75 cents; 1,500 bbls. prime white, at 80 cents; also, sales for July at 76½ to 77 cents; and for August at 77a78 cents. Free oil has advanced rapidly for the past few days, and at the close 95 cents is offered for white; 500 bbls. sold for this price late last night. Sales have been made from 82 cents up to this figure.

Benzole is in better inquiry, at 36a38 cents.

Remarks.—The failure of a house on heavy contracts (principally to shippers,) together with the advance of Gold, and, consequently, of Exchange, has caused much demand for oil for export. The arrivals here are small, and the stock on hand is light. The present flow of the wells is not over 4,000 bbls. daily. Parties have made contracts to deliver shippers, oil in future months. Oil has advanced, and it is reported four houses have failed to deliver the oil. The shippers sold their exchange at the time the contracts were made, and, consequently, they have to submit to heavy losses, and come into the market now, and buy the oil at much higher prices, for which they have sold their Exchange when Gold was at $1 80.

The arrivals for the past fifteen days are 29,192 bbls., and the exports for same time 1,060,554 galls.

B. L. Harsell,
Commission Merchant,
132 & 134 Maiden Lane.

The Submarine Cables of the World.—From an official communication of the Gutta-percha Company, London, to Cyrus W. Field, Esq., it appears that fifty-two lines of submarine cable have been laid by English firms in different parts of the world, all of which are in successful operation with the exception of that between France and Algiers, and it is supposed that that was injured by lightning. The longest line in operation is that between Malta and Alexandria, 1,535 miles. The deepest water in which any working cable rests is 1,550 fathoms—1 4-5 miles—between Toulon and Corsica. The aggregate length of working lines given in the table is 5,105 miles, and this does not include a number of short lines laid in different parts of the world, nor those laid by Felten & Guilleaume, of Cologne, amounting to more than 1,000 miles. One line has been laid 13 years, five have been laid 11 years, four 10 years, and others shorter periods.—*Scientific American.*

Equivaletns in Force.—Joule's theory of the equivalents in force and heat is receiving a great attention and some curious corollaries. Professor Helmholtz says that the human body, viewed as a calorific engine, is capable of doing much more work, compared with the fuel consumed, than any steam engine. The pulsations of the heart in one hour generate a force which would raise that organ twenty-two thousand feet high in a certain time, while the same amount of heat in the best constructed engine could not raise the weight of the engine more than two thousand seven hundred feet.

Scientific Expedition.—France is preparing a scientific expedition to Mexico on a magnificent scale. The Minister of Public Instruction has nominated a commission to prepare and instruct this phalanx of savans.

MINING.

We copy the following intelligence from the *Mining and Scientific Press* of San Francisco:

First Monthly Shipment.—The first monthly shipment of Table Mountain copper ore has been received in this city, consisting of 52 tons. It is now lying on Moore & Folger's wharf, and will be dispatched to New York by vessel now loading. This ore is a fine quality of sulphurets, assaying 27½ per cent. The lead in the lower level, we are informed, now consists of five feet of sulphurets. At the present time the company are taking out from four to five tons per day. They will put up steam machinery immediately, the same to be paid for out of the products of the ore. The company expect, hereafter, to be able to make regular monthly shipments of ore.

Timely Strike.—A correspondent, writing from Brown's Valley, Yuba county, under date of the 23d inst., states, that very rich quartz was struck in the Dannebrage mine—a fortunate circumstance for all hands, as had this strike not occurred, the men would all have been discharged in a few days, and the mine closed up on account of its poverty. This busy mining camp still keeps up its bustle and activity. We are promised regular correspondence from this locality in future.

Another Strike.—A correspondent informs us that Messrs. Autry & Henderson, of Grass Valley, took out on Monday last over $2,000 in specimens from their gravel claim in Mary's Ravine. They took out about the same amount a few weeks since. This is pretty good for old ground that has been trod over for years and supposed to be worthless.

Rich Quartz.—A very rich vein of gold bearing quartz has recently been found near Howland Flat, Sierra county. The ledge was accidentally struck by a party of men engaged in grading a foundation for a saw-mill.

Quartz Ledge.—A valuable and extensive gold bearing quartz ledge has been discovered near Franklin Hill, in Plumas county, by Messrs. Shaw & Murray. The lode has been traced and located for a distance of one mile.

Palmyra District.—The claim of the Lyon Company, in the Palmyra District, on a thorough practical working test, yielded $117.76 per ton. The Altamonte Company have their tunnel in 345 feet. Eighty feet more will strike the ledge, at a depth of 240 feet. The Mountain Queen is located in a northerly direction from the Whitman ledge, and has prospected as high as $800 to the ton; it is being rapidly developed—so says the Como *Sentinel*.

Mining at West Point.—Mining at West Point, Calaveras county, is now carried on more extensively, and prosecuted with greater success, this season, than for a number of years past. The idea which has so long prevailed, that our ledges of quartz did not extend to a great depth, has been discarded, and a majority of our miners are working leads heretofore abandoned as worthless. Many of them are working 90 and 100 feet below the greatest depth heretofore obtained, and with the most satisfactory results; so says a correspondent of the Calaveras *Chronicle*.

Kentucky Company.—This company keeps steadily at work running its tunnel ahead. This work is now something over 500 feet in length, and is well timbered all the way. It is one of the longest and best tunnels on the American Flat. It is now in such a distance that considerable inconvenience is experienced from the closeness of the air. To remedy this inconvenience, a large bellows has been placed at the mouth of the tunnel, from which air is forced in through a tin tube—an inconvenient and expensive way of ventilating, which the company would do well to throw aside, as quickly as possible, and resort to the system of natural ventilation. Quite a large stream of water is now running out of the tunnel, which the company considers very good evidence that they are close upon the ledge.

New Coal Company.—The Daniel Low Coal Mining Company filed their incorporation on Saturday last, 14th ult. The mine is in Washoe county.

Good Yield.—The Shasta *Courier* of the 21st ult., says that week the proprietors of the Jollie mill cleaned up after a run of eight days, and realized the handsome sum of 51 ounces. Only four hands employed.

Struck it Rich.—We learn through Langton & Co's agent at Como, says the *Enterprise* of the 21st inst., that very rich ore was struck day before yesterday in the Monte del Rey shaft, at the depth of 170 feet. The rock is said to be not only very rich but of a very handsome appearance, none but the best judges being able to distinguish it from the rich black sulphuret ores of the leading mines of the Comstock range.

Lady Bryan.—The Territorial *Enterprise* of the 21st ult., says the Lady Bryan has struck a large deposit of splendid ore—equal to the very best they have ever found. This is supposed to be a continuation of the streak first found, and which, a few months since, caused so much excitement about the mine. Owing to a break, or fault, in the lead, they were for a time off the track of the pay streak, and were drifting at random through a large body of quartz containing but small deposits of ore, but they finally worked in the right direction and found it again within twenty feet of where it so mysteriously disappeared.

The Fuller Copper Co.—The Marysville *Appeal* says: After six or eight months the Fuller Copper claim, located at Brady's ranch, in this county, at a depth of 157 feet, have struck copper which we should guess to be 40 per cent. pure ore. The claim is still under the superintendence of M. Fuller, Esq., of this city.

Buckeye.—The opening of this claim is progressing finely. The company have lately had about 20 tons of ore worked, and the result, from all accounts, is highly satisfactory. They have twenty tons more out, ready for the mill. They do not anticipate very extraordinary returns from this rock, as what they are now taking out is merely incidental to the proper opening of their claim.

Struck their Ledge.—The Jewett and Shepard cut through into their ledge on Monday last, at a depth of 225 feet, meeting with a large influx of water, which soon drove the workmen from the drift, but not until they had secured about a ton of quartz. The Gold Hill *News*, having seen some of the rock, says that it shows not only considerable free gold, but rich black silver sulphurets also, in sufficient abundance to give it a decided value.

Improvement in Working.—Mr. Kuh, an assayer, at Virginia City, informs the Virginia *Union* that the Washoe Mills have made a vast improvement recently in the fineness of their bars. Two or three years ago a mill whose bars contained but 300 parts of base metal out of 1,000, thought they were working very close—now the fineness of the bars ranges all the way from 850 to 992. The Government standard is only 900, the remaining 100 being alloy, so that many of the silver bars now being shipped from the Territory are actually purer than our own coin.

The Largest Shaft.—The Ophir Company has for several weeks been sinking a shaft which, when it was commenced, was the largest in the Territory; but the Savage Company has lately commenced one which is larger still, being upwards of eight feet wide and twenty feet long. The timbers which are used are hewed twelve inches square, and are placed one above the other three feet apart. These timbers divide the shaft into four compartments, each five by six feet in size in the clear. This shaft is now about fifty feet deep.

No Loss Without Some Gain.—The great flood of 1861–2, which deluged, and, for the time being, desolated the whole Valley of the Sacramento, appears to have carried at least partial compensation with it. Thousands of acres of new land were formed along the margin of the tule marshes by the sand, and rich sediment deposited by the waters, and this season the fields thus increased in size will be nealy the only ones in the State which will yield plentiful crops.

Reducing.—The Mount Ellen Mining Company have filed in the County Clerk's office, a certificate for the reduction of their capital stock from $600,000 to $360,000, thus making the par value of shares $200 instead of 500 each.

Dissolution of a Mining Corporation.—The Tajo Gold and Silver Mining Company has filed its application in the County Court for a decree of dissolution. This company was organized about a year, ago for the purpose of mining at or near the city of Rossario, in Sinaloa; but, it being found inconvenient and undesirable to continue to transact the business under its present corporate form, owing to the peculiarities of the Mexican mining laws, under which the above mine was owned and worked, the above petition for dissolution has been filed.

Truly Liberal.—The workmen employed by the Gould & Curry Mining Company, Virginia City, are having a silver brick made, which, when completed, will be worth $5,000, and will be presented to the Sanitary Fund. This is true liberality, surely.

Good Return.—The Blue Gravel Claim (placer) at Smartsville, cleaned up, after a run of two weeks of their mill, the snug sum of $44,000. This company, we believe, has recently erected a mill for the crushing of their cemented gravel.

Another Dissolution.—Judge Cowles, of the County Court, has granted in chambers an order disincorporating and dissolving the Kentucky Copper Mining Company, which desires to reincorporate under another name. The mine of this company is located at Copperopolis, Calaveras County.

The operations of the past few weeks, ending May 28, have done much to restore confidence in the wealth and permanency of the Esmeralda mines. Companies and individuals have very properly dismissed their anxiety for a rise in stocks, and are devoting their entire energies to the development of their claims. The policy of such a course is already apparent.

A Mining Share Sale in Victoria.—The Victoria *Chronicle* tells as follows how British Columbia mining shares sell: J. P. Davis & Co. yesterday sold by auction 155 feet in the American Mining Company, Gold Stream, at 67½c. and 45c. per foot; 119 shares Sangster Copper Company, at 35c.; 10 feet in the Parmenter Quartz Mining Company, Gold Stream, at $1 per foot; Eureka Copper Company, 25c. per foot.

Devon Great Consols.—The twentieth annual meeting of the proprietors of these mines was held at the offices, Gresham House, London, on Tuesday, the 10th ult., and the details there presented will probably be interesting to persons connected with mining, partieularly in this neighborhood.

It appears that during the year, the amount realized from sales of copper ore is £132,000; and out of this sum £60,000 has been paid for labor, iron, timber, &c., required for general purposes. The rates and taxes paid at Tavistock exceed £1,200. There has been a grant of £185 to the schools and charities of the town, and the Duke of Bedford has received £10,500, making a total of £180,000 for dues since the commencement of this great discovery.

The total value of the ore raised during the working of the mines exceeds two millions and a quarter sterling; and considerably more than half of this enormous sum has been spent in the immediate neighbor hood. And from the report furnished by Captain Richards, it would seem that after twenty years of uninterrupted success, the mines still continue in a high state of prosperity, there being a stock of ore in reserve, reaching 70,000 tons, and within the few past weeks a new lode has been discovered at Wheal Josiah which is upwards of 100 fathoms south of the main workings, standing whole throughout the sett, presenting a most masterly appearance, and is the most important discovery that has been met with for years past.—*Sherbrooke Freeman.*

The yield of thirty-seven silver-mines in Nevada Territory is estimated at $1,000,000 per month, of which the Gould & Curry furnishes $450,000.

Petroleum.—The Santa Cruz Petroleum Company have two hundred gallons of refined oil ready for shipment to San Fracisco.

In Philadelphia there are 357 miles of water-pipe and 592 miles of gas-pipe.

GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

CORRECTED BY JOHN B. MURRAY & CO., No. 11 BROAD STREET, NEW YORK, SHARE BROKERS.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1857	ADRIAN	Mich.	50,000	50	—	May & November.	4,000	3 50	....	....	
1856	AKRON	O.	20,000	33⅓	—	Do.	3,500	3 00	....	....	
1845	ALBANY	N. Y.	250,000	20	4	January & July.	65,800	3 00	120	....	None in market.
1858	ALBION	N. Y.	30,000	100	—	Do.	3,000	3 80	....	....	
1851	ALEXANDRIA	Va.	106,530	—	—	City Works.	9,000	3 50	....	....	
1852	ALLEGHANY	Pa.	200,000	25	4	May & November.	25,000	3 00	....	....	
1853	ALLENTOWN	Pa.	60,000	100	—	Do.	5,000	3 50	....	....	
1857	ALTON	Ill.	75,000	—	3½	Private Works.	4,000	3 50	....	....	
1859	ALTOONA	Pa.	40,000	20	4	January & July.	5,000	3 00	....	....	
1859	AMESBURY AND SALISBURY	Mass.	30,000	25	—	Do.	7,000	4 00	....	....	
1858	ANNAPOLIS	Md.	100,000	25	—	Do.	4,000	4 00	....	....	
1858	ANN ARBOR	Mich.	23,000	50	5	March & September.	5,500	4 00	....	....	
1858	ASTORIA	N. Y.	20,000	50	—	Do.	6,000	4 00	....	....	
1855	ATLANTA	Ga.	50,000	25	5	January & July.	12,000	5 00	....	....	
1857	ATTLEBORO'	Mass.	6,000	50	3	Do.	2,000	6 00	....	....	
1850	AUBURN	N. Y.	80,000	50	5	Do	10,000	7 00	....	....	
1851	AUGUSTA	Ga.	80,000	25	8	Do.	9,000	6 00	....	....	
1853	AUGUSTA AND HALLOWELL	Me.	84,700	50	5	Do.	10,000	4 00	....	....	
1860	AURORA	Ind.	10,000	—	—	Private Works.	3 500	3 50	....	....	Formerly used Sanders' Water-Gas. Recently altered to Coal Gas-Works.
1817	BALTIMORE	Md.	550,000	100	5	June & December.	150,000	2 50	150	....	None for sale.
1852	BANGOR	Me.	120,000	100	2½	January & July.	12,000	3 00	100	....	
1855	BATAVIA	N. Y.	32,000	20	4	Do.	2,500	4 00	100	100	Stock firm. Good works and well managed.
1853	BATH	Me.	65,000	100	3	April & October.	10,000	3 75	....	....	
1859	BATH	N. Y.	15,000	50	—	May & November.	3,000	7 00	....	....	
1861	BATTLE CREEK	Mich.	15,000	—	—	January & July.			....	....	
1858	BELFAST	Me.	14,000	100	—	Do.	7,000	7 00	....	....	
1856	BELLEFONT	Pa.	20,000	25	2	Do.	3,500	4 00	....	....	
	BELOIT	Wis.	30,000	—	—	Do.	4,000	4 00	....	....	
1854	BETHLEHEM	Pa.	50,000	50	4	June & December.	2,000	3 20	....	....	
1859	BEVERLY	Mass.	40,000	100	—	January & July.	4,000	4 00	....	....	
1853	BINGHAMPTON	N. Y.	50,000	50	3½	Do.	10,000	4 00	....	....	
1859	BIRMINGHAM	Pa.	40,000	50	—	Do.	4,000	4 00	....	....	
1855	BLOOMINGTON	Ill.	40,000	50	—	Do.	6,000	4 00	....	....	
1858	BORDENTOWN	N. J.	50,000	25	3	June & December.	4,000	3 80	....	....	
1822	BOSTON	Mass.	1,000,000	500	5	Do.	130,000	2 50	....	....	
1859	BRATTLEBORO'	Vt.	21,000	—	—	Do.	3,000	4 00	....	....	
1851	BRIDGEPORT	Ct.	90,000	25	4	January & July.	10,000	4 00	90	....	Passed last dividend.
1857	BRIDGETON	N. J.	50,000	20	—	Do.	5,000	4 00	....	....	
1856	BRISTOL	Pa.	30,000	25	3	February & August.	3,000	4 00	....	....	
1855	BRISTOL	R. I.	35,000	50	2	January & July.	6,000	4 00	....	....	
1859	BROCKPORT	N. Y.	25,000	100	3	Do.	1,500	4 00	....	....	
1858	BROOKLINE	Mass.	77,000	100	4	February & August.	3,500	3 50	....	....	
1825	BROOKLYN	N. Y.	2,000,000	25	5	January & July.	75,000	2 50	170	160	
	BROWNSVILLE	Pa.				Do.			....	....	
1848	BUFFALO	N. Y.	600,000	50	5	Do.	70,000	2 90	140	125	
1852	BURLINGTON	N. J.	100,000	25	3½	Do.	5,000	4 00	105	....	
1853	BURLINGTON	Vt.	75,000	25	2½	Do.	10,000	4 50	....	....	
1859	BURLINGTON	Iowa.	65,000	50	—	Do.	8,000	4 00	....	....	
1861	CALAIS	Me.	90,000	100	—	Do.	10,000	3 50	....	....	
1852	CAMBRIDGE	Mass.	300,000	100	5	February & August.	20,000	3 50	100	97½	
1852	CAMDEN	N. J.	300,000	100	3	April & October.	15,000	3 85	105	100	
1853	CANANDAIGUA	N. Y.	50,000	50	—	January & July.	3,000	4 00	90	80	
1856	CANTON	O.	19,000	50	6	March & September.	6,000	3 00	....	....	
1853	CAPE ISLAND	N. J.	80,000	100	—	October.	10,000	6 00	....	....	Watering place —These Works only run in summer.
1860	CARBONDALE	Pa.	16,000	25	—	March & September.	5,000	4 00	....	....	
1855	CARLISLE	Pa.	30,000	25	—	January & July.	4,000	4 00	....	....	
1856	CATASAUQUA	Pa.	15,000	25	5	May & November.	2,000	4 00	....	....	
1858	CATSKILL	N. Y.		—	—	Private Works.	3,000	3 00	....	....	Owned by G. T. Sutton.
1857	CHAMBERSBURG	Pa.	30,000	25	—	January & July.	3,000	4 00	....	....	
1846	CHARLESTON	S. C.	723,800	25	4	Do.	50,000	4 00	....	....	
1851	CHARLESTOWN	Mass.	200,000	50	4	Do.	30,000	3 00	....	....	
1858	CHARLOTTE	N. C.	14,000	50	10	March & September.	3,500	6 00	....	....	
1859	CHARLOTTEVILLE	Vt.	15,000	25	—	Do.	4,000	4 50	....	....	
1851	CHELSEA	Mass.	100,000	100	3½	January & July.	8,000	3 50	....	....	
1856	CHESTER	Pa.	85,000	25	3	April & October.	4,000	4 00	....	....	
1849	CHICAGO	Ill.	1,300,000	25	5	January & July.	109,800	2 50	150	140	Very scarce. Stock wanted.
1857	CHICOPEE	Mass.	50,000	20	—	Do.		4 00	....	....	
1851	CHILLICOTHE	O.	40,000	25	4	Do.	12,000	3 50	....	....	
1841	CINCINNATI	O.	1,600,000	100	5	Do.	225,000	2 50	....	....	
1859	CITIZENS', BROOKLYN	N. Y.	1,000,000	20	—	Do.	135,000	3 00	128	125	
1860	CITIZENS', READING	Mass.	20,000	100	—				....	....	
	CLARKESVILLE	Tenn.	100,000	50	—	Do.	5,000	4 00	....	....	
1860	CLAREMONT	N. H.	20,000	100	—	March & September.	3,000	4 00	....	....	
1846	CLEVELAND	O.	200,000	10	5	January & July.	29,000	3 00	....	....	
1858	CLINTON	Mass.	30,000	500	5	Do.	3,000	4 00	....	....	
1859	CLYDE	N. Y.	10,000	50	4	Do.	2,500	4 00	....	....	
1854	COHOES	N. Y.	50,000	20	3½	April & October.	5,000	3 60	....	....	
1860	COLD SPRING	N. Y.	30,000	50	—	Do.	3,500	4 00	95	....	Formerly Rosin-Gas, but now Coal. A well managed company. Stock firmly held.
1860	COLD WATER	Mich.	25,000	50	5	January & July.	4,000	4 00	....	....	
1852	COLUMBIA	Pa.	37,500	25	—	Do.	4,000	3 50	....	....	
1852	COLUMBIA	S. C.	44,000	25	4	Do.	6,000	6 00	....	....	
1857	COLUMBIA	Cal.	50,000	25	—	Do.	4,500	10 00	....	....	
1858	COLUMBUS	Ga.	54,000	25	5	Do.	5,000	7 00	....	....	
1850	COLUMBUS	O.	100,000	10	6	Do.	30,000	3 00	....	....	
1858	CONCORD	N. H.	50,000	50	5	Do.	8,000	3 50	....	....	
1853	COVINGTON AND NEWPORT	Ky.	100,000	50	3½	Do.	28,000	4 00	....	....	
1854	CUMBERLAND	Md.	60,000	50	3	Do.	6,000	4 00	....	....	
1857	DANBURY	Ct.	50,000	25	4	Do.	2,000	3 75	....	....	
1856	DANVILLE	Pa.	30,000	25	—	June & December.	3,000	4 00	....	....	
1855	DAVENPORT	Iowa.	56,000	100	—	Do.	6,000	5 00	....	....	
1848	DAYTON	O.	50,000	25	5	February & August.	8,000	3 50	....	....	
1853	DEDHAM	Mass.	40,000	50	—	January & July.	3,000	4 00	....	....	
1860	DELAWARE	O.	30,000	25	—	Do.	2,500	3 00	....	....	
1849	DETROIT	Mich.	500,000	50	5	Do.	30,000	3 50	160	150	Excellen ock. No sales.
1860	DOBB'S FERRY	N. Y.	25,000	—	—	Do.	3,000	4 00	....	....	
1854	DORCHESTER	Mass.	150,000	100	—	Do.	14,000	4 00	....	....	
1859	DOVER	Del.	12,000	—	—	Private Works.	2,000	4 00	....	....	
	DOVER	N. H.				January & July.			....	....	
1857	DOYLESTOWN	Pa.	50,000	—	—	Do.	3,000	4 00	....	....	
1854	DUBUQUE	Iowa.	50,000	115	3½	Do.	17,000	4 50	....	115	This stock is wanted at par.
1853	EAST BOSTON	Mass.	133,000	25	4	Do.	20,000	3 50	....	145	No transactions.
1858	EAST GREENWICH	R. I.	11,200	100	15	Do.	3,000	7 00	....	....	
1861	EAST HAMPTON	Mass.	10,000	25	—	Do.	5,000	9 00	....	....	
1861	EAST NEW YORK	N. Y.	50,000	50	—	Do.	12,000	3 50	....	....	
1857	EASTON	Md.	9,000	10	—	Do.	1,500	7 00	....	....	
1850	EASTON	Pa.	125,000	50	4	June & December.	6,000	3 60	....	....	
1856	EASTPORT	Me.	50,000	55	—	Do.	3,000	4 00	....	....	
1855	ELIZABETH	N. J.	100,000	20	4	January & July.	14,000	3 50	....	....	
	ELLICOTT'S MILLS	Md.	10,000	—	—	Do.	4,000	4 00	....	....	
1852	ELMIRA	N. Y.	50,000	25	3½	Do.	5,000	4 00	....	....	
1852	ERIE	Pa.	68,000	50	3½	June & December.	10,000	3 00	....	....	
1853	EVANSVILLE	Ind.	60,000	50	4	January & July.	12,000	4 00	110	....	A very good Company.
	EXETER	N. H.	60,000	—	—	Do.	12,000		....	....	
	FAIR HAVEN	Ct.	20,000	25		Do.	8,000	4 00	....	....	
1847	FALL RIVER	Mass.	26,000	—	—	Private Works.	12,000	3 50	....	....	
1859	FAYETTEVILLE	N. C.	25,000	100	6	January & July.	7,000	6 00	....	....	
	FIFTH WARD (Milwaukee)	Wis.	50,000	25	—	Do.	10,000	4 00	....	....	
1857	FISHKILL	N. Y.	10,000	20	—	April & October.	1,500	9 00	....	....	
1853	FITCHBURG	Mass.	100,000	50	3	January & July.	5,000	4 00	....	....	Make Petroleum-Gas.
1859	FLEMINGTON	N. J.	20,000	—	—	Do.	3,000	4 00	....	....	
1855	FLUSHING	N. Y.	20,000	50	1½	March & September.	6,500	4 00	....	....	
1858	FOLSOM	Cal.								....	
	FORT WAYNE	Ind.	40,000	25	—	Do.	6,000	4 00	....	....	
1851	FRANKFORT	Ky.	50,000	—	—	City Works.	5,500	4 50	....	....	
1851	FREDERICK CITY	Md.	36,000	100	—	January & July.	5,000	6 70	....	....	
1854	FREDERICKSBURG	Va.	72,500	50	5	Do.	4,500	4 00	....	....	
1858	FREDONIA (Natural Gas)	N. Y.	10,000	100	—	Do.	2,000	4 00	....	....	Unlimited supply of Natural Gas.
1856	FREEPORT	Ill.	20,000	100	—	May & November.	10,000	4 00	....	....	

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When Chartered.	Town.	State.	Chartered Capital.	Par Val. Per Sh. $	Semi-Ann'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1859	FREMONT	O.	25,000	25	—	May & November.	2,000	4 50	....	....	
1858	FULTON	N. Y.	12,000	100	—	Do.	4,000	7 00	....	....	
1855	GALENA	Ill.	70,000	100	—	Do.	8,000	4 00	....	....	
1859	GALION	O.	25,000	25	—	January & July.	1,800	3 00	....	....	
1858	GALVESTON	Texas.	150,000	50	—	May & November.	7,000	6 00	....	....	
1854	GARDINER	Me.	100,000	50	4	Do.	8,000	4 00	....	....	
1853	GENEVA	N. Y.	75,000	25	2½	Do.	6,000	4 00	....	....	
1851	GERMANTOWN	Pa.	Merged	inte	the	Philadelphia Works.	12,000	2 25	....	....	
1859	GETTYSBURG	Pa.	20,000	50	3	January & July.	2,500	4 00	....	....	
1854	GLEN'S FALLS	N. Y.	35,000	50	3	February & August.	4,000	4 00	....	....	
1854	GLOUCESTER	Mass.	40,000	50	—	January & July.	5,000	3 50	....	....	
1857	GLOVERSVILLE	N. Y.	15,000	25	—	Do.	3,000	3 50	....	....	
1858	GRAND RAPIDS	Mich.	50,000	20	—	Do.	3,000	4 00	....	....	
1855	GREAT BARRINGTON	Mass.	5,000	100	5	April & October.	2,000	7 00	....	....	
1849	GREAT FALLS	N. H.	50,000	100	3	Do.	3,000	4 00	....	....	
1860	GREENFIELD	Mass.	20,000	50	2	January & July.	2,500	4 00	....	....	
1853	GREENPOINT	N. Y.	100,000	50	5	Do.	20,000	3 00	....	....	Close corporation.
1859	GREENSBORO'	N. C.	12,000	50	—	April & October.	3,000	7 00	....	....	
1858	GREENSBURG	Pa.	30,000	25	3	May & November.	2,000	3 00	....	....	
1854	HAGERSTOWN	Md.	15,000	20	—	January & July.	2,000	6 00	....	....	
	HAMILTON	O.	15,000			Do.			....	....	
1859	HANNIBAL	Mo.	100,000	100	—	Do.	6,000	3 50	....	....	
1857	HARLEM	N. Y.	350,000	50	3½	Do.	25,000	3 00	....	145	
1855	HARRISBURG	Pa.	100,000	—	4	Do.	5,000	4 00	....	....	
1849	HARTFORD	Ct.	200,000	25	4	Do.	25,000	3 00	150	140	Stock in demand.
	HASTINGS	N. Y.				Do.	8,000	4 00	....	....	
1853	HAVERHILL	Mass.	50,000	50	—	Do.	5,000	4 00	....	....	
1859	HAVERSTRAW	N. Y.	26,000	100	—	Do.	5,000	4 00	....	....	
1861	HAYESVILLE	Mass.	15,000	25		Do.	4,000	4 00	....	....	
1859	HEMPSTEAD	N. Y.	16,000	25	—	Do.	1,000	4 00	....	....	
1862	HOBOKEN	N. J.	100,000	25	3	Do.	30,000	2 50	....	100	Works not yet built.
1856	HOLLIDAYSBURG	Pa.	30,000	25	2	Do.	4,000	3 50	....	....	
1861	HOLYOKE	Mass.	20,000	25	—	Do.	3,000	4 00	....	....	
1861	HOMER & CORTLANDT	N. Y.	40,000	100	—	Do.	6,000	4 00	....	....	
1854	HONESDALE	Pa.	30,000	25	3	Do.	2,500	4 00	....	....	
1860	HORNELLSVILLE	N. Y.	12,000	50	—	Do.	2,000	4 00	....	....	
1853	HUDSON	N. Y.	50,000	100	3½	February & August.	3,000	4 00	....	....	
	HUNTER'S POINT	N. Y.									
1857	HUNTINGTON	Pa.	18,000	50	3	Do.	2,000	3 50	....	....	
1856	HUNTSVILLE	Ala.	7,325	25	—	June & December.	2,000	5 00	....	....	
	INDIANAPOLIS	Ind.	150,000	—	—	Do.	15,000	5 00	....	....	
1857	IOWA CITY	Iowa.	40,000	50	—	February & August.	4,000	4 50	....	....	
1852	ITHACA	N. Y.	75,000	25	3½	January & July.	6,000	4 00	....	....	
1857	JACKSON	Mich.	25,000	50	5	Do.	6,000	3 50	....	....	
	JACKSON	Miss.	80,000	50	—	Do.	4,000	4 50	....	....	
	JACKSON	Cal.	50,000	30	—	Do.	4,000	10 00	....	....	
	JACKSONVILLE	Flor.	30,000	20	—	Do.	2,000	7 00	....	....	
	JACKSONVILLE	Ind.	50,000	50	—	Do.	4,000	5 00	....	....	
1858	JACKSONVILLE	Mo.	25,000	25	—	Do.	7,000	6 00	....	....	
1856	JAMAICA	N. Y.	20,000	—	4	Do.	6,000	4 00	....	....	
1853	JAMAICA PLAIN	Mass.	78,000	100	3	Do!	3,000	3 00	....	....	
	JAMESTOWN	N. Y.	25,000	—	—	Do	4,000	4 00	....	....	
1856	JANESVILLE	Wis.	50,000	100	—	Do.	12,000	4 00	....	....	
	JEFFERSONVILLE	Md.	30,000	25		Do.	4,000	4 00	....	....	
1853	JERSEY CITY	N. J.	300,000	—	5	Do.	80,000	3 00	150	....	No sales since formation of Hoboken Co.
1858	JERSEY SHORE	Pa.	15,000	25	—	Do.	2,000	3 70	....	....	
1856	JOHNSTOWN	Pa.	80,000	25	3	Do.	8,000	3 00	....	....	
1857	JOLIET	Ill.	300,000	100	—	June & December.	6,000	4 00	....	....	
1858	KALAMAZOO	Mich.	30,000	50	5	Do.	10,000	4 00	....	....	
1860	KEENE	N. H.	60,000	100	—	Do.	4,500	4 00	....	....	
1855	KEOKUK	Iowa.	100,000	100	—	January & July.	10,000	4 50	....	....	
1855	KINGSTON	Pa.	50,000	50	—	Do.	3,000	4 00	....	....	
1859	KITTANNING	Pa.	20,000	—	—	Doubtful.	5,000	4 00	....	....	Said to be a fraud.
1854	KNOXVILLE	Tenn.	68,000	—	—	April & October.	4,000	5 00	....	....	
1860	LACONIA	N. H.	20,000	100	—	Do.	4,000	6 00	....	....	
1859	LA CROSSE CITY	Wis.	100,000	50	—	June & December.	10,000	8 00	....	....	Petroleum and Wood Gas.
1854	LAFAYETTE	Ind.	60,000	50	4	January & July.	10,000	3 25	....	....	
1856	LAMBERTVILLE	N. J.	30,000	25	—	Do.	2,600	4 00	....	....	
1849	LANCASTER	Pa.	100,000	50	4	Do.	10,000	3 00	....	....	
1856	LANCASTER	O.	25,000	100	5	Do.	5,000	3 50	....	....	
1855	LANSINBURG	N. Y.	25,000	100	—	Private Works.	7,000	4 00	....	....	
1849	LAWRENCE	Mass.	200,000	100	4	February & August.	15,000	3 50	....	....	
1859	LEAVENWORTH	Kansas.	200,000	25	—	Private Works.	15,000	4 00	....	....	
1856	LEBANON	Pa.	26,000	50	—	February & August.	5,000	4 00	....	....	
1861	LE ROY	N. Y.	25,000	50	—	Do.	4,000	4 00	....	....	
1858	LEWISBURG	Pa.	20,000	100	—	January & July.	4,000	4 00	....	....	
1852	LEWISTON	Me.	100,000	100	3	Do	10,000	3 20	....	....	
1856	LEWISTOWN	Pa.	30,000	50	3	April & Octobe	3,000	3 10	....	....	
1853	LEXINGTON	Ky.	100,000	25	4	January & Jul	5,000	4 00	....	....	
1853	LITTLE FALLS	N. Y.	112,000	25	—	Do.	3,500	7 00	....	....	
1861	LITTLE ROCK	Ark.	26,000	—	—	Do.	5,000	6 00	....	....	
1859	LOCKHAVEN	Pa.	28,000	—	—	Do.	3,000	4 00	....	....	
	LOCKPORT	N. Y.	100,000	50	—	Do.	4,000	4 00	....		
	LOGANSPORT	Ind.	40,000		5	April & October.	5,000	4 00	105		But $481,400 stock has been sold. This Company has a large contingent fund and undivided profit on hand.
1838	LOUISVILLE	Ky.	600,000	50	6	January & July.	80,000	2 50	125	....	
1849	LOWELL	Mass.	200,000	25	5	Do.	50,000	3 25	....	....	
1852	LYNCHBURG	Va.	70,000	25	5	Do.	6,000	3 80	....	....	
1852	LYNN	Mass.	55,000	50	4	Do.	20,000	4 00	....	....	
1859	LYONS	N. Y.	30,000	100	—	Do.	4,000	4 00	....	....	
1852	MACON	Ga.	75,160	25	6	Do.	5,000	5 00	....	....	
1851	MADISON	Ind.	160,000	25	3	Do.	10,100	3 50	....	....	
1855	MADISON	Wis.	100,000	25	—	Do.	5,000	5 00	....	....	
1854	MALDEN & MELROSE	Mass.	50,600	25	3	February & August.	5,000	4 00	....	....	
1852	MANAYUNK	Pa.	40,000	100	—	Do.	7,000	4 00	....	....	
1852	MANCHESTER	N. H.	100,000	100	5	January & July.	25,600	3 00	....	....	
1830	MANHATTAN (N. Y. City)	N. Y.	4,000,000	50	5	Do.	600,000	2 50	....	....	
	MANSFIELD	O.	25,000	—	—	Do.	10,000	4 00	....	....	
1854	MARBLEHEAD	Mass.	40,000	100	3	Do.	1,000	4 00	....	....	
	MARLBORO'	Mass.	20,000	—	—	Do.	8,000	4 00	....	....	
	MAUCH CHUNK	Pa.	50,000	50	—	Do.	7,000	4 00	....	....	
1857	MARIETTA	O.	50,000	50	—	Do.	7,000	4 00	....	....	Stock firm.
1860	MARION	O.	12,000	25	5	April & October.	1,500	18 55	....	....	
1858	MARYSVILLE	Cal.	50,000	100	—	January & July.	4,000	2 50	....	....	
1857	MASSILON	O.	20,000	25	—	Do.	5,000	3 00	....	....	
1855	MEADVILLE	Pa.	39,000	25	3	Do.	4,000	3 50	....	....	
	MEDINA	N. Y.	2,000	100	—	Do.	2,000	7 00	....	....	
1852	MEMPHIS	Tenn.	300,000	100	5	June & December.	12,000	5 00	....	....	
	MERIDEN	Ct.	20,000			Do.			....	....	
1859	METROPOLITAN (N. Y. City)	N. Y.	1,000,000	100	—	January & July.	200,000	2 50	....	....	
1859	MIDDLEBORO'	Mass.	15,000	—	—	Private Works.		6 00	....	....	
1853	MIDDLETOWN	Ct.	50,000	25	3	March & September.	5,000	3 80	....	....	Owned by G. T. Sutton
	MIDDLETOWN	N. Y.		25	—	Private Works.	3,000	3 00	....	....	
	MILFORD	Mass.	20,000	—	—	Do.		4 00	....	....	
	MILLEDGEVILLE	Ga.	100,000	50	—	Do.		5 00	....	....	
	MILTON	Pa.	10,000			Do.			....	....	
1847	MILWAUKEE	Wis.	400,000	50	5	January & July.	24,000	3 50	150	....	
1852	MOBILE	Ala.	200,000	—	—	Do.	30,000	4 50	....	....	
1836	MONROE	Mich.	40,000	50	—	Do.	5,000	3 50	50	....	
1852	MONTGOMERY	Ala.	100,000	25	4	February & August.	7,000	6 00	....	....	
1856	MONTPELIER	Vt.	30,000	25	3	January & July.	5,000	4 50	....	....	
1859	MORRISANIA	N. Y.	30,000	50	—	Do.		4 00	....	....	
1859	MORRISTOWN	N. J.	18,000	50	—	Do.	3,500	4 00	....	....	
1854	MOUNT HOLLY	N. J.	16,650	25	3	April & October.	2,000	7 00	....	....	
	MOUNT VERNON	O.	50,000	100	—	Do.		4 00	....	....	
1857	MUSCATINE	Iowa.	50,000	100	—	January & July.	3,000	4 50	....	....	
1854	NANTUCKET	Mass.	50,000	100	3	February & August.	6,000	4 00	....	....	

GAS-LIGHT COMPANIES IN THE UNITED STATES.—Continued.

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CORRECTED BY JOHN B. MURRAY & CO., No. 11 BROAD STREET, NEW YORK, SHARE BROKERS.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-Ann'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1852	Nashua	N. H.	45,000	50	3½	January & July.	10,000	3 50	....	....	
1850	Nashville	Tenn.	200,000	50	5	Do.	25,000	3 50	....	....	
1858	Natchez	Miss.	46,000	50	—	Do.	20,000	5 00	....	....	
	Nevada City	Cal.							....	....	
1852	New Albany	Ind.	200,000	50	3½	Do.	16,000	3 50	....	....	
1846	Newark	N. J.	362,000	50	5	Do.	45,000	3 62	130	....	Always a favorite stock.
1856	Newark	O.	30,000	100	—	Do.	7,000	5 40	....	....	
1852	New Bedford	Mass.	130,000	100	5	Do.	15,000	2 20	102	....	
1859	Newbern	N. C.	22,000	100	6	Do.	6,000	3 50	....	....	Well managed and kept quiet.
	New Britain	Ct.	30,000	20	5	Do.	3,000	4 00	....	....	
1851	New Brunswick	N. J.	100,000	20	4	Do.	8,000	3 00	115	....	
1852	Newburg	N. Y.	67,000	20	4	Do.	10,000	4 00	105	....	
1852	Newburyport	Mass.	150,000	10	4	Do.	9,000	4 00	92½	....	
1857	Newcastle	Del.	32,300	10	3	Do.	4,000	4 00	90	....	
1847	New Haven	Ct.	250,000	25	4	Do.	30,000	3 00	155	....	None in market.
1853	New London	Ct.	70,000	50	3	Do.	12,000	4 00	105	....	
1835	New Orleans	La.	1,500,000	100	6	Do.	120,000	4 00	180	....	
1858	Newport	R. I.	130,200	100	4	Do.	10,000	3 50	112	....	
1854	Newton & Watertown	Mass.	92,000	100	2	Do.	10,000	4 00	....	....	
	Newton	N. J.	30,000	—	—	Do.	3,000	4 00	....	....	
	Newton	Pa.	20,000	50	—	Do.	2,500	4 00	....	....	
	Newtown	N. Y.									
1825	New York	N. Y.	1,000,000	50	5	May & November.	100,000	2 50	300	....	
1859	Niagara Falls	N. Y.	15,000	25	—	Do.	3,000	4 00	90	....	
	Norfolk	Va.	60,000	25	—	Do.	40,000	4 00	....	....	
1828	Norristown	Pa.	41,700	25	4	June & December.	8,000	3 50	....	....	
1855	North Attleboro'	Mass.	50,000	100	3½	Do.	6,000	4 00	....	....	
	Northern Liberties	Pa.	400,000	25	7	City Works.	40,000	2 50	....	....	
	North Adams	Mass.	25,000	—	—	March & September.	30,000	4 00	....	....	
1876	Northampton	Mass.	35,000	25	3	January & July.	4,500	4 00	....	....	
1870	North Bridgewater	Mass.	16,000	100	4	June & December.	1,000	7 00	....	....	
1854	Norwalk	Ct.	30,000	150	4	February & August.	6,000	4 00	....	....	
1859	Norwalk	O.	30,000	25	—	January & July.	4,000	4 00	....	....	
1854	Norwich	Ct.	75,000	25	3½	Do.	12,000	3 50	....	....	
1871	Norwich	N. Y.	12,000	50	—	Do.	2,500	4 00	....	....	
1870	Nyack	N. Y.	20,000	100	—	Do.	2,500	4 00	....	....	
1850	Oberlin	O.	10,000	—	—	Do.	1,200	4 00	....	....	
1855	Ogdensburg	N. Y.	75,000	50	5	Do.	9,000	4 00	....	....	
1859	Orange	N. J.	65,000	25	—	Do.	6,000	3 50	....	....	
1852	Oswego	N. Y.	81,250	100	3½	Do.	15,000	4 00	105	....	
1855	Ottawa	Ill.	45,000	100	6½	Do.	6,000	4 00	....	....	Good works, built by Hoy, Jr., & Kennedy.
1856	Owego	N. Y.	40,000	50	3½	Do.	5,000	4 00	....	....	
1850	Owensboro'	Ky.	25,000	25	—	Do.	4,000	3 50	....	....	
1856	Paducah	Ky.	75,000	100	—	May & November.	4,000	5 00	....	....	
1851	Painsville	O.	40,000	25	5	Do.	2,500	5 00	....	....	
1856	Palmyra	N. Y.	12,000	25	—	January & July.	3,000	7 00	....	....	
1847	Paterson	N. J.	125,000	25	3	Do.	20,000	3 50	95	....	
1850	Pawtucket	R. I.	75,000	50	4	Do.	12,000	3 00	....	....	
1855	Peekskill	N. Y.	31,000	50	3	June & December.	4,000	4 00	....	....	Surplus $10,000, May 15, 1863.
1850	Penn Yan	N. Y.	12,000	50	5	Do.	3,000	4 00	....	....	Works leased to Gilbert T. Sutton.
1859	Peoples', Chicago	Ill.	500,000	50	New	Do.	100,000	2 50	....	....	
1855	Peoria	Ill.	100,000	50	4	Do.	8,000	3 50	....	....	What is this Company doing?
1852	Petersburg	Va.	120,000	—	5	January & July.	20,000	3 80	....	....	
1841	Philadelphia	Pa.	3,000,000	50	—	City Works.	650,000	2 50	....	....	
1855	Piqua	O.	50,000	50	—	January & July.	6,500	4 00	....	....	
1855	Pittsburg	Pa.	800,000	100	5	Do.	60,000	1 50	115	....	
1854	Pittsfield	Mass.	50,000	100	5	Do.	4,500	4 00	....	....	
1858	Placerville	Cal.	30,000	50	—	Do.	4,500	10 00	....	....	
1850	Plainfield	N. J.	25,000	50	—	Do.	2,500	4 00	....	....	
1859	Plattsburg	N. Y.	16,000	50	—	January & July.	5,000	7 00	....	....	
1853	Plymouth	Mass.	40,000	100	—	April & October.	8,000	4 00	....	....	
1850	Port Chester	N. Y.	50,000	50	—	Do.	4,000	4 00	....		
1850	Port Jervis	N. Y.	20,000	100	—	Do.	3,000	4 10	....	....	
1849	Portland	Me.	300,000	50	4	January & July.	20,000	3 00	....	....	
1859	Portland	Oreg.	50,000	50	—	Do.	3,500	8 00	....	....	
1859	Portland	Texas.	50,000	100	—	Do.	2,500	7 00	....	....	
1851	Portsmouth	N. H	70,000	100	3	April & October.	6,500	3 70	....	....	
1855	Portsmouth	O.	50,000	50	4	January & July.	10,000	3 50	....	....	
1855	Portsmouth	Va.	100,000	50	4	Do.	4,000	4 00	....	....	
1856	Pottstown	Pa.	20,000	50	3	Do.	3,500	4 00	....	....	
1850	Pottsville	Pa.	110,000	50	2	Do.	10,000	3 50	....	....	
1850	Poughkeepsie	N. Y.	84,000	25	4	March & September.	15,000	3 50	120	110	
1848	Providence	R. I.	1,000,000	50	4	January & July.	60,000	3 00	122	....	
1853	Quincy	Ill.	200,000	50	4	June & December.	12,000	3 50	....	....	
	Quincy	Mass.	60,000	00	—	Do.	60,000	0 00	....	....	
1855	Racine	Wis.	43,500	26	—	Do.	7,000	3 50	....	....	
1857	Rahway	N. J.	50,000	20	—	January & July.	5,000	4 00	....	....	
1858	Raleigh	N. C.	25,000	100	6	May & November.	5,000	6 00	....	....	
1848	Reading	Pa.	100,000	25	4	January & July.	25,000	3 00	....	....	
1851	Richmond	Va.	341,975	—	—	City Works.	30,000	3 00	....	....	Jeff. Davis has extinguished the gas-lights of Richmond, Va.
1850	Richmond	Mass.	40,000	25	—	January & July.	3,000	4 00	....	....	
	Richmond County	N. Y.									
1859	Ripley	O.	25,000	50	—	April & October.	2,000	4 00	....	....	
1852	Rochester	N. Y.	200,000	50	5	January & July.	50,000	2 50	....	....	
1857	Rockford	Ill.	40,000	50	—	Do.	4,000	4 00	....	....	
1854	Rock Island	Ill.	100,000	50	—	Do.	6,000	4 50	....	....	
1854	Rockland	Me.	50,000	100	—	Do.	6,000	4 40	....	....	
1852	Rome	N. Y.	85,000	100	3½	Do.	10,000	3 60	....	....	
1854	Rondout and Kingston	N. Y.	65,150	20	3½	June & December.	10,000	3 80	....	....	
1854	Roxbury	Mass.	150,000	100	5	January & July.	20,000	3 00	....	....	
1859	Rutland	Vt.	20,000	25	—	Do.	4,000	3 50	....	....	
	Saco	Me.	71,600	100	3½	April & October.	8,000	4 00	....	....	
1857	Sacramento	Cal.	500,000	100	—	Do.	40,000	10 00	....	....	
1849	Sag Harbor	N. Y.	20,000	—	—	Do.	4,000	4 00	....	....	
1858	Saint Albans	Vt.	15,000	20	—	Do.	3,000	7 00	....	....	
	Saint Johnsbury	Vt.	30,000	25	—	Do.	4,000	4 00	....	....	
1857	Saint Joseph	Mo.	50,000	100	5	January & July.	6,000	5 00	....	....	
1839	Saint Louis	Mo.	600,000	50	—	June & December.	180,000	3 50	....	....	
1857	Saint Paul	Min.	200,000	50	3	January & July.	10,000	6 00	....	....	Surplus $10,000, May 15, 1863.
1856	Salem	N. J.	30,000	25	3	Do.	5,000	3 86	....	....	
1850	Salem	Mass.	200,000	100	4	February & August.	30,000	3 24	....	....	
1859	Salem	O.	25,000	20	—	Do.	3,000	3 00	....	....	
1859	Salisbury	N. C.	14,600	50	6	May & November.	2,500	6 00	....	....	
	Salisbury Mills	Mass.	1,250	25	—	Do.	3,000	4 00	....	....	
	Salmon Falls	Me.	25,000	100	—	Do.	3,000	4 00	....	....	
	San Antonio	Texas.	75,000	20	—	Do.	40,000	6 00	....	....	
1854	Sandusky	O.	75,000	50	—	April & October.	9,000	3 00	....	....	
1859	Sandwich	Mass.	10,000	—	—	Private Works.	2,000	3 50	....	....	
1852	San Francisco	Cal.	2,000,000	100	4½	Do.	100,000	6 50	100	....	
	San Jose	Cal.							....	....	
1858	Saratoga Springs	N. Y.	32,000	100	—	January & July.	6,000	3 60	70	....	
	Saugerties	N. Y.	30,000	20	—	Do.	4,000	3 00	....	....	
1849	Savannah	Ga.	200,000	25	5	Do.	10,000	3 75	....	....	
1851	Schenectady	N. Y.	50,000	—	—	Private Works.	11,000	4 00	....	....	
1858	Scranton, Gas and Water.	Pa.	100,000	25	—	January & July.	6,000	3 80	....	....	
1857	Selma	Ala.	20,000	100	—	Do.	2,000	5 00	....	....	About trying Water-Gas.
1856	Seneca Falls and Waterloo	N. Y.	80,000	50	5	Do.	10,000	4 00	100	....	
	Shreveport	La.	40,000	25	—	Do.	3,000	6 50	....	....	
1853	Sing Sing	N. Y.	40,000	100	—	Do.	3,000	3 50	....	....	
	Smyrna	Del.						4 00	....	....	Petroleum Gas.
1860	South Adams	Mass.	10,000	25	—	Do.	3,000	4 00	....	....	
1850	South Bridge	Mass.	5,000	25	—	Do.	4,010	6 00	....	....	
	South Boston	Mass.	200,000	50	—	Do.	60,000	3 25	110	....	
	Springfield	O.	200,000	100	—	Do	20,000	3 50	....	....	
1854	Springfield	Ill.	75,000	50	—	January & July.	10,000	3 50	....	....	
1848	Springfield	Mass.	100,000	500	5	February & August.	10,000	3 60	140	....	
1855	Stamford	Ct.	6,250	25	5	April & October.	3,000	3 50	....	....	
1857	Staten Island	N. Y.	150,000	50	5	January & July.	26,000	4 00	95	....	

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1853	STAUNTON	Va.	18,000	50	6	January & July.	4,000	7 00	....	....	
	STEUBENVILLE	O.	150,000	100	—	Do.	15,000	4 00	....	....	
	STOCKTON	Cal.	50,000	—	—	Do.	8,000	10 00	....	....	
1848	SYRACUSE	N. Y.	125,000	25	5	March & September.	25,000	3 00	112	....	
	TAMAQUA	Pa.	40,000	25	—	Do.	3,000	4 00	....	....	
1859	TARRYTOWN and IRVINGTON	N. Y.	70,000	50	—	January & July.	3,000	4 00	....	....	
1853	TAUNTON	Mass.	100,000	50	4	Do.	10,000	4 00	....	....	
	TERRE HAUTE	Ind.	160,000	100	—	Do.	3,000	4 00	....	....	
	THOMPSONVILLE	Ct.	25,000	50	—	Do.	4,000	4 50	....	....	
	TIFFIN	O.	25,000	20	—	Do.	4,000	4 00	....	....	
1853	TOLEDO	O.	100,000	50	3	Do.	8,000	3 50	....	....	
1847	TRENTON	N. J.	100,000	20	4	Do.	15,000	3 42	....	110	
1848	TROY	N. Y.	200,000	100	4	June & December.	35,000	3 00	160	....	
1856	URBANA	O.	30,000	25	—	April & October.	3,500	4 00	....	....	
1849	UTICA	N. Y.	80,000	100	4	Do.	22,000	3 60	....	....	
1853	VICKSBURG	Miss.	66,000	50	—	March & September.	4,000	4 50	....	....	
1859	VINCENNES	Ind.	25,000	100	—	January & July.	2,000	4 00	....	....	
1863	VIRGINIA CITY	N. T.					20,000				
1858	WALDEN	N. Y.	2,500	—	—	Private Works.	1,000	6 00	....	....	
1853	WALTHAM	Mass.	100,000	100	4	January & July.	3,000	4 00	....	....	
1857	WARE	Mass.	30,000	20	—	Do.	3,500	4 00	....	....	
1861	WARREN	O.	30,000	50	—	Do.	4,000	3 00	....	....	
1854	WARREN	R. I.	20,000	25	—	Do.	3,000	4 00	....	....	
1855	WASHINGTON	D. C.	500,000	20	5	Do.	50,000	2 61	....	100	
1859	WASHINGTON	N. C.	15,000	100	—	April & October.	1,500	6 00	....	....	
1848	WASHINGTON	Pa.	20,000	25	4	January & July.	4,000	3 00	....	....	
1854	WATERBURY	Ct.	160,000	25	—	Do.	4,000	4 00	....	....	
1852	WATERFORD	N. Y.	12,000	25	—	Do.	4,000	4 00	....	....	
1852	WATERTOWN	N. Y.	20,000	100	—	Do.	10,000	7 00	....	....	
1856	WATERTOWN	Wis.	25,000	100	—	Do.	5,000	5 00	....	....	
1858	WAUTOMA	Wis.	30,000	50	—	Do.	3,000	4 50	....	....	
1857	WAVERLY	Miss.	20,000	100	—	April & October.	4,000	5 00	....	....	
1854	WEST CAMBRIDGE	Mass.	60,000	100	—	February & August.	10,000	4 00	....	....	
1852	WESTCHESTER	Pa.	100,000	25	2½	Do.	3,500	3 50	....	....	
	WESTFIELD	Mass.	25,000	100	6	Do.	4,000	4 00	....	....	
	WESTON	O.	20,000	25	—	Do.		5 00	....	....	
1857	WEST POINT	N. Y.	50,000	—	—	United States Military	Academy.	2 00	....	....	
1853	WEST TROY	N. Y.	100,000	50	3	January & July.	10,000	3 60	85	....	
1850	WHEELING	Va.	75,000	25	6	Do.	12,000	2 70	....	....	
	WHITE PLAINS	N. Y.	20,000	20	—	Do.			....	....	
1856	WILKESBARRE	Pa.	50,000	50	—	May & November.	4,000	3 33	100	80	
1850	WILLIAMSBURG	N. Y.	1,000,000	50	5	January & July.	60,000	3 60	....	....	
1858	WILLIAMSBURG	Va.	30,000	25	—	Do.	3,000	4 00	....	....	Camp-fires of the Union Army light up this place at present.
1857	WILLIAMSPORT	Pa.	70,000	25	4	Do.	3,500	3 80	....	....	
1859	WILLIMANTIC	Ct.	12,000	—	—	Do.	2,500	3 50	....	....	
1853	WILMINGTON	N. C.	60,000	50	5	Do.	8,000	5 00	....	....	
1852	WILMINGTON	Del.	200,000	50	5	February & August.	20,000	3 00	....	....	
1854	WINCHESTER	Va.	36,000	50	6	January & July.	5,000	4 00	....	....	
1861	WINDSOR	Vt.	20,000	25		Do.	2,000	6 00			Make Petroleum Gas.
	WOBURN	Mass.	20,000	—	—	Do.	3,000	4 00	....	....	
1856	WOODSTOCK	Vt.	10,000	50	4	Do.	4,000	6 00	....	....	
1853	WOONSOCKET	R. I.	82,600	100	4	April & October.	4,000	3 50	....	....	
1856	WOOSTER	O.	25,000	50	—	January & July.	6,000	3 00	....	....	
1849	WORCESTER	Mass.	160,000	100	5	Do.	15,000	3 50	....	....	
1855	XENIA	O.	40,000	50	—	Do.	3,000	4 00	....	....	
1854	YONKERS	N. Y.	100,000	50	3½	Do.	10,000	3 50	110	16½	
1849	YORK	Pa.	40,000	57	3	June & December.	10,000	3 50	....	....	
	YORKVILLE	S. C.	20,000	25	—	Do.	4,000	4 00	....	....	
1858	YPSILANTI	Mich.	20,000	50	5	February & August	6,000	14 00	....	....	
1850	YREKA	Cal.	80,000	100	—	Do.	2,000	6 00	....	....	
1848	ZANESVILLE	O.	44,600	25	4	Do.	10,000	3 00	....	..	

GAS-LIGHT COMPANIES IN THE BRITISH PROVINCES OF NORTH AMERICA.

When Chartered.	Town.	Province	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
1854	BELLEVILLE	C. W.	33,040	100	4	January & July.	1,200	5 00	....	....	
1854	BRANTFORD	C. W.	32,000	100	2½	Do.			....	....	
	BROCKVILLE	C. W.	50,000	—	—	Do.	5,000	4 00	....	....	
	CHATHAM	N. B.	50,000	—	—				....	....	
1854	CHARLOTTE TOWN	P. E. I.	50,000	100	5	Do.	3,000	3 50	....	....	
1857	COBOURG	C. W.	30,000	—		February & August.	4,000		....	....	
	DUNDAS	C. W.	30,000	—	—	Do.	6,000	4 00	....	....	
	FREDERICK	N. B.	50,000	—	—	Do.			....	....	
1843	HALIFAX	N. S.	160,000	40	7	May.	20,000	3 00	....	....	
1850	HAMILTON	C. W.	125,000	40	5	March & September.	20,000	3 50	....	....	
1848	KINGSTON	C. W.	80,000	100	—	Do.	6,000	3 50	....	....	
1853	LONDON	C. W.	100,000	20	5	May & November.	5,000	5 00	....	....	
1847	MONTREAL	C. E.	460,000	40	—	March & September.	110,000	2 80	....	113	Last sale at this figure.
1854	OTTAWA	C. W.	40,000	40	5	Do.	5,000	4 50	....	....	
1859	POINT LEVI	C. E.	25,000	25	—	January & July.	4,000	3 50	....	....	
1859	PORT HOPE	C. W.	28,000	20	4	May & November.	4,500	3 50	....	....	
1847	QUEBEC	C. E.	200,000	200	4	January & July.	60,000	3 00	....	....	
1848	SAINT CATHERINE'S	C. W.	80,000	20	—	May & November.	7,000	4 50	....	....	
1859	SAINT HYACINTHE	C. E.	15,000	20	—	Do.	4,000	4 00	....	....	
	SAINT JOHN	N. B.	170,000	85	4	June & December.	25,000	3 00	110	110	Sales at this figure.
	SAINT JOHN 2	N. F.	50,000	—	4	Do.	30,000		....	....	
1858	SOREL	C. E.	14,000	20	4	Do.	4,000	3 00	....	....	
1848	TORONTO	C. W.	400,000	50	—		50,000	3 00	....	....	This Co. pay a quarterly div. of 2 per ct.

GAS-LIGHT COMPANIES IN CUBA, MEXICO, SOUTH AMERICA AND NEW ZEALAND.

When Chartered.	Town.	State.	Chartered Capital.	Par Val. per Sh. $	Semi-An'l Div'd.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Asked pr. cent.	Offered pr. cent.	REMARKS.
	CALLAO	Chile.		—	—	January & July.	20,000	7 00	....	....	
	CARDENAS	Cuba.	50,000	—	—	Do.	180,000	5 00	....	....	
1857	COMPANIA CUBANA	Hav'a.	500,000	500	10	Do.			....	....	
	CIENFUGOS	Cuba.		—	—	Do.	12,000	5 00	....	....	These four towns are lighted by the Compania Cubana of Havana.
	GUANABACOA	Cuba.		—	—	Do.	14,000	5 50	....	....	
	REGLA	Cuba.		—	—	Do.	10,000	5 00	....	....	
	TRINIDAD	Cuba.		—	—	Do.	16,000	5 00	....	....	
	GUINESS	Cuba.		—	—	Do.			....	....	
	GUYAQUIL	S. A.	150,000	—	—	Do.	35,000		....	....	
	HAVANA	Cuba.	2,000,000	500	—	Quarterly.	200,000	5 00	....	175	
	LIMA	Peru.	100,000	—	—	January & July.	150,000		....	....	
	MARANHAM (Chartered)			—	—	Do.			....	....	
	MATANZAS	Cuba.	50,000	—	—	Do.	180,000	8 50	....	....	
	MEXICO CITY	Mex.	550,000	—	—	Do.			....	....	
	MONTEVIEDO	S. A.	500,000	—	—	Do.			....	....	
	PARA (Chartered)			—	—	Do.			....	....	
1854	RIO DE JANEIRO	S. A.	1,000,000	500	7½	Do.	300,000	4 00	....	....	
	SAN IAGO	Chile.	500,000	—	—	Do.	180,000	7 00	....	....	
1857	SAINT JAGO DE CUBA	Cuba.	450,000	500	—	Do.	25,000	5 00	....	....	
	VALPARAISO	Chile.	500,000	—	—	Do.	85,000	6 00	....	....	
	VERA CRUZ	Mex	500,000	—	—	Do.			....	....	
	VILLE CLARA	Cuba.	50,000	—	—	Do.			....	....	
	AUCKLAND	N. Z.		—	—	Do.			....	....	

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SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.
W. S. SHERMAN, PUBLISHER.
DOCTOR C. ELTON BUCK, CONSULTING CHEMIST.

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JAMES W. BRYANT, ... EDITOR.

FRIDAY, JULY 1, 1864.

TO OUR PATRONS.

Upon undertaking the charge of this Journal, we are not insensible or indifferent to, the responsibility assumed. Representing interests involving many millions of dollars, and believing that our statements, reviews, and reports, will influence many persons in forming opinions in reference to investments in those interests, we would be devoid of honor were we regardless of it. Individually we shall, perhaps, do but little to place our Journal at the high stand-point we have fixed for it, but having secured the co-operation and assistance of gentlemen of science, experience, knowledge, and integrity to supply our columns with valuable information and facts upon the subjects our Journal is devoted to, we do not think we presume too much in asking for confidence and support in our enterprise.

We shall endeavor to make the paper not only interesting, but valuable for future reference, as our statistics will be reliable.

Our columns will be fully opened *to all* for information or discussion of value to the public, but should we find ourselves imposed upon by false representations we will expose them at the earliest moment after discovering them to be so.

We are very happy in having Doctor C. Elton Buck (former Editor,) in the Mineral Department as our consulting analytical chemist, and we shall be favored by occasional articles from his pen.

We hope to be received considerately and cordially by the editorial fraternity, offering to them any courtesy in our power. We enter the field not as a rival, but as an earnest co-worker in the immense field open to us all.

JAMES W. BRYANT.

TO OUR READERS.

The ownership of the AMERICAN GAS-LIGHT JOURNAL has passed into other hands. Commencing with the next number, it will be issued by its new proprietor, JAMES W. BRYANT, Esq., to whom it has been sold, and for whom the most favorable and generous welcome is bespoken from its readers. Mr. BRYANT is already known to the reading world, as proprietor and publisher of the *Cuban Messenger*, an enterprising paper published by him for some time in Havana, but which was suspended on account of the war in America.

The AMERICAN GAS-LIGHT JOURNAL sprang into existence on the first day of July, 1859, as an adjunct to my banking business. It was intended originally to be a mere price current of gas-light shares, but so urgent was the need of a paper of its kind, that it soon grew into what it now is. It has gone steadily forward, in the face even of the disastrous war, of diminished subscriptions, limited advertisements, greatly increased price of paper, type, material, and labor, and yet it has not faltered in the size, frequency, or extent of its issues. It was never more prosperous than at present, and in the hands of Mr. BRYANT we believe it can never be less so. He is, in my opinion, quite competent to conduct it as it should be conducted, and he should command the confidence and support of all who are interested in the specialties treated by the JOURNAL.

Mr. BRYANT asks no favors; he will be independent in his course, and just. He takes the JOURNAL with all its impetus upon it, and will certainly move on with it to triumphant success.

I part regretfully with my friend, C. ELTON BUCK, Esq., its able and faithful editor, my association with whom is a privilege I have greatly valued. As a chemist he is destined to rank high; and yet the regrets at our severing our connection are lessened by the reflection that his increasing professional engagements rendered it necessary to devote his whole time to them.

JOHN B. MURRAY.

June 15th, 1864.

NECESSITY OF SCIENTIFIC MINING ENGINEERS.

The disproportion of scientific and experienced geologists and intelligent practical mining engineers, to the demand for gentlemen of that class is remarkable. While the public are generally interested in the valuable mineral developments in all sections of the country, and are investing millions of dollars in them, many of these developments are being made under the supervision and advice of persons who are superficial in their knowledge, experience and education, and entirely inadequate to the position they assume; hence, the many failures and impositions which are inflicted upon the people. Here in our own city we have hundreds of young men, talented and well educated in the professions of law and medicine, who cannot get business enough for a support, when, if they would turn their attention to scientific and practical geology—and especially the branch of mineralogy—and prospect our mining districts, they would soon become deeply interested in the fascinating study, and not only bring to themselves compensatory employment, but be of incalculable benfit to the public. Let briefless lawyers and patientless doctors give this attention, and their reward will be certain.

OUR office is at the service of gentlemen interested in the objects of our enterprise, and as we shall have the most valuable papers, journals, and reports in reference thereto, it may be agreeable and interesting for some to avail themselves of the opportunity to review them. Engineers from abroad, or the interior, are especially requested to call upon us, and if they desire it, their letters may be addressed to our office, No. 15 Nassau street.

WE request, and shall esteem it a great favor, if parties possessing valuable knowledge or information relating to the subjects we treat upon, will send it to us, either in a crude state for us to prepare, or what would be more grateful to us, prepare it themselves for publication, giving their names to the public or not, as they wish.

WE are indebted to the Hon. J. W. CHAULER for Ex. Doc. No. 45, being a graphic and interesting account of the expedition of Captain JAMES L. FISK to the Rocky Mountains, overland. It conveys much valuable information, and is open for reference at our office.

CARRINGTON'S PURCHASING AGENCY.—This "Institution" is really valuable as well as convenient to the public generally, although more so to persons who either cannot visit the city, or who are unacquainted with its business places. It is not uncommon to find a difference of ten per cent. in the wholesale prices of standard goods in the same street, and the lowest price stores can only be found by actual experience. In purchasing pianos, carriages, furniture, jewelry, or other valuable articles, a large sum can be saved by going to the original manufacturer or principal agent, and CARRINGTON & Co. can always promptly find anything wanted, and buy it, at a less price than a stranger can. A commission of five per cent. is certainly saved in difference of cost, besides saving time, and perhaps escaping some actual imposition without means for redress.

The recommendations of CARRINGTON & Co to the public are from the highest sources, assuring their integrity, capacity, and prompt attention to business.

MINERALS.—We shall be thankful for specimens of minerals, either curious or valuable, and will have them labeled and preserved in a cabinet for reference. If desired, we will submit them to our consulting analytical chemist, Doctor C. ELTON BUCK, for a superficial observation (without charge), and should they be deemed worthy an analysis, the parties who send the specimens will be informed.

THE NEW FUEL—OLATE OF COAL.

On Thursday a series of experiments were made at the smithy of Messrs. Clinton and Owen, of Whitefriars street, to prove the merits of the new napthaline fuel, manufactured by Mr. A. Wall. From the results obtained, it is anticipated that the fuel will become one of the most serviceable yet produced. It is stated that its chief advantage is that the sulphurious vapor arising from the fuel in ordinary use is neutralized; in proof thereof, after something less than a pound of the napthaline had been thrown upon the furnace, and covered with a large quantity of new lumpy coal, no smoke was emitted—in fact, not a particle of free carbon was visible, and nothing but pure hydrogen, or smoke that had not been burned, was to be seen in the white moisture, or steam, which arose from the coal. The bars of iron which were heated by the fires charged with the patent fuel, were in a more perfect state of fusion than those which had been subjected to the ordinary coal fire, and were welded with greater completion, owing, no doubt, chiefly to the absence of flaking, which is by this method obviated to a very great degree. The workmen themselves said that the application in smithies of this fuel would be a great boon to them and their employers, as all the smoke which usually attends the blowing of the forge would be done away with by it, and the work would be "turned out" much more satifactorily to both parties.

It is to be hoped that Messrs. Clinton and Owen will find the naphthaline fuel as economic and effieient when generally introduced as in the experimental trial above alluded to; for, should they do so, it may reasonably be expected, that not only will an improved quality of iron be produced, but that much of the small coal now comparatively worthless will be utilized. The reactions which take place to bring about the results recorded are not, it is true, so apparent to the practical chemist of ordinary experience as those obtained in some other processes; but this matters little so long as the effects are produced. It may happen that Mr. Wall's discovery will be the means of enabling existing chemical theories to be rendered more nearly accurate; and if Mr. Wall succeeds in decomposing fire-damp without any effect being produced upon the material used to compose it, his claim to be considered a chemist of unquestionable merit will be so fully established that his opinion will be received as conclusive.—*Mining Journal.*

THE SHORT COPPER MINE.—The shaft is now at a depth of eight feet from the surface, showing good specimens of copper ore disseminated throughout. Neither of the walls has yet been met with; they will most likely concentrate in depth. The vein on the surface, which carries copper, is more than twenty feet wide.—*Sherbrooke Truman, Canada East.*

We take from the *Sherbrooke Truman, Canada East*, June 23d, the following report of their mining correspondent:

The Clark Mine.—The No. 1 shaft is now at a depth of eighty feet from the surface. The vein is six feet wide, and rich in copper. In the open workings north of this shaft, the mine is looking well, and has a large extent of mineral ground opened, and the men are blasting out vast quantities of ore. This is a very extraordinary course of copper, and from the new weekly developments made on this range, a large amount of mineral may be anticipated for a length of time to come. The No. 4 shaft is now down sixty-five feet. The vein is about six feet wide, being composed of copper ore, iron pyrites, carbonate of lime, intermixed with slate. The adit level is progressing well.

The Ascot Copper Mine.—In the forty-two feet level, west from the cross-cut north, the vein is much improved, being now four feet wide, producing good stones of copper ore. In the eastern level, the vein is about the same, having no material alteration. In the stopes east of Harvey's Shaft, the vein is still very rich, producing ten tons of ore to the fathom. The discoveries that have been lately made northeast and west of the present workings are looking well, and producing large quantities of ore. This mine is now in a prosperous state, and will yield large amounts of copper.

The Sherbrooke Mine.—E. Clarke, Esq., has again resumed working this valuable property, and on paying it a visit on Monday last, was pleased with the new discovery made a few days since in the open cuttings. The vein looks rich, and is turning out beautiful specimens of copper ore of a rich per centage.

On the farm of James Wilson, Esq., near Lennoxville, the men have discovered some rich veins of copper; the specimens shown are good indications for its future success. This mine belongs to Messrs. McCaw & Co.; I shall speak more fully of its progress next week.

The reports of the St. Flavien and St. Francis Mines will be for the future inserted every two weeks.

Some very fine specimens of variegated copper pyrites (Erubesite) were shown me by George Robertson, Esq., of this town, having been blasted from his mining property, near Brompton Lake; they are certainly equal to any produced in the Eastern Townships, that that I have seen.

WATER.

Water Elevator.—The Alpine *Chronicle* gives the following description of a novel water elevator now in use at Diamond Hill, on the east fork of Carson River, and employed to draw water from that river: "A half-inch wire, 180 feet in length, is set on posts running from the road down to the river, at an angle of thirty-five degrees. At the upper end is a wheel, two feet in diameter, with a crank; to the cord on the wheel is attached the car, a board one foot in length and eight inches wide, which is connected to the wire by two sheaves. When you wish to draw water, you hang the pail on the car by a spring hook, starting the same down the wire to the river; the pail fills itself without any trouble. By turning the wheel the car with its load comes up so easily that a child could raise it. It is called the Railroad and Telegraph Water Raiser."

An Ancient Bucket-engine.—M. Deligny, now engaged in working the copper-mines of San Domingos, in the province of Alemtejo, Portugal, has just sent a bucket-wheel, dating from the Roman period, to the Conservatoire des Arts et Métoirs, and a paper on the subject to the Academy of Sciences. The above-mentioned mines, where this wheel was found, were worked in the earliest ages by the first nations that peopled the Iberian Peninsula. The chief mines in Portugal were Setubal and Troya; in Spain, the mountains of Tharsis and Zalamen, or Solomon, whither Solomon and Hiram sent their fleets to procure the copper required for the decoration of the Temple. The great importance of these mines is shown by the masses of scoriæ still visible around, and which are estimated at 20,000,000 of tons. These scoriæ also revealed two different systems of treatment of the ore, pertaining one to the Phœnician, the other to the Roman period, there having been an interruption between the two by the wars between Carthage and Rome, and the conquest of the country by the latter. It would appear that the Romans resumed the working of these mines under Cæsar, coins bearing his effigy and that of Augustus having been found in them; the working was not discontinued until the invasion of the barbarians under Honorius. An inscription preserved in the Mining School at Madrid shows that under Nerva the working of the mines of Thartesis Batica was regularly organized. The Romans worked them very systematically; the waters were drained off through galleries, which in many cases attained a considerable length, as much sometimes as 1,400 metres. When these shafts were very deep, an additional shaft for ventilation was sunk close to the main ones; they sometimes were 80 metres in depth. But as the hardness of the rock sometimes prevented the miners from continuing their galleries below the level of the waters, these would accumulate in certain places, and then a bucket-engine was used to pump them out. The one sent to the Conservatoire, and discovered at San Domingos, is 6.66 metres in diameter. The spokes are of fir, the axle and its supports of oak. The buckets, twenty-five in number, are sixteen centimetres in width, by fifty in length and thirteen in height. All the pieces of the wheel are joined without any metallic fittings. The wheel was set in motion by men in the manner a treadmill is worked. The quantity of water thrown out per second was 1.84 hectolitres. This wheel dates from the year 412 of our era, and has, therefore, existed 1,452 years It is certainly the oldest relic of its kind.

Water-meters in Philadelphia.—All large consumers of water in Philadelphia are to be charged hereafter by the gallon. Mr. Birkinbine, the chief engineer, has issued a circular announcing that water-meters will be introduced at the expense of the consumers, and bills collected quarterly at the following rates: From one thousand to ten thousand gallons per day, two cents per hundred gallons; for from ten thousand to twenty thousand gallons per day, one and a half cents per one hundred gallons; for from twenty thousand gallons per day and upward, one cent per hundred gallons.

GAS.

Making Steel from Iron with Gas.—About twenty-five years ago, Mr. C. McIntosh, a manufacturing chemist, of Glasgow, Scotland, made several tons of cemented steel by submitting iron, at a dull-red heat, to the action of lighted gas, operating with from 100 to 150 lbs. at a time, the iron bars being two inches broad, and quite thin. The cementation took from eighteen to twenty hours, and when the operation exceeded that time supercarburation took place. Thus, by the sole action of lighting gas, without mixture of any foreign body, it is possible to obtain either steel or cast-iron; it is only a question of time or temperature. To obtain steel there is no need to add ammonia previously, in order to nitrogenize the iron. Steel and cast-iron differ only in containing diverse proportions of the same elements, as pure white cast-iron can be tempered and even forged like steel; witness the white cast-iron of Lieges, used for making screwplates.

The Brighton and Hove Gas Co. have made a reduction in the gas supplied to the town of New Shoreham. The present reduction will be 6d. per 1,000 feet, and a further reduction of 6d. will be made in March, 1865. The superintendent of the Brighton Company was closely questioned at a meeting on the subject, as to the low price charged at Plymouth. The meeting resolved that the reduction in price promised should begin at Midsummer, 1864, instead of March, 1865.

The Troy Gas-Light Company have raised their price from $3 50 to $4 00 per 1,000 feet.

London Gas Companies.—It appears, from official returns, that the total sum received by thirteen metropolitan gas companies in 1862 was £1,840,969, and that the total working expenses were £1,282,566, leaving a balance of profit of £558,403. After providing for £41,112 for interest on debentures, the companies had still £517,291 available for dividends on their shares. The receipts of each company were as follows: Chartered, £276,336; City of London, £114,523; Commercial, £123,754; Equitable, £83,798; Great Central, £91,385; Imperial, £175,428; Independent, £78,738; London, £170,724; Phœnix, £170,588; Ratcliffe, £36,013; South Metropolitan, £78,663; Surrey Consumers, £62,129; and Western, £78,890. The working expenses of each company in the same period were: Chartered, £203,969; City of London, £83,390; Commercial, £85,515; Equitable, £40,152 Great Central, £60,027; Imperial, £333,986; Independent, £60,341; London, £119,098; Phœnix, £214,852; Ratcliffe, £24,438; South Metropolitan, £55,548; Surrey Consumers, £41,392; and Western, £50,858. The profits realized by each undertaking were, accordingly: Chartered, £72,367; City of London, £31,133; Commercial, £38,239; Equitable, £34,646; Great Central, £31,358; Imperial, £141,442; Independent, £18,397; London, £51,626; Phœnix, £55,736; Ratcliffe, £11,575; South Metropolitan, £23,115; Surrey Consumers, £20,737; and Western, £28,032.

Wood Gas.—The town of Wilma, England, is to be lighted with gas from pine-wood. The basins will contain 60,000 cubic feet of water. The gasometer, of cast-iron, will be of the same capacity. The plan exhibits three distinct edifices for the distillation of gas, its purification, and distribution. Forty-tows in Germany, Hungary, Italy, and Switzerland, and quite lately Helsingfors, owe their lighting to gas distilled from wood or jutesal.

An Enormous Ironfield.—According to statements made by the directors of the Trent, Ancholme, and Grimsby Railway, opened recently, the new line will bring Grimsby nine miles nearer Manchester, fourteen nearer the South Yorkshire coalfields, and twenty-three or twenty-four nearer the most densely populated portion of the West Riding, while the quantity of iron ore contained in the newly-found iron district is the astounding sum of 3,500,000,000 tons. Comparisons have been instituted between the new iron-field in Cleveland and the new one in Licolnshire, to show that the northern one is but a fleabite in comparison with the one on the banks of the Trent, the total of the Cleveland being stated at 500,000,000 tons.—*Sheffield Telegraph.*

How to Render Ivory Flexible.—Ivory, like the substance of all teeth, consists of about 70 per cent. of phosphate of lime, 10 per cent. of carbonate of lime, and 20 per cent. of gelatinous matter, or cartilage. Immerse it in a strong solution of phosphoric acid until it becomes transparent, then take it out, wash in water, and dry with a soft cloth, and it will be found as flexible as leather. On exposure to the air, it returns to its original hardness; but may be again rendered flexible by merely soaking it in hot water.

Remarkable.—The Mississippi river about the mouth of the Missouri averages 3,600 feet in width. From there to the mouth of the Ohio it averages 3,200 feet; from the Ohio to the Arkansas to the Red river about 2,700 feet; and from the Red river to the Gulf of Mexico the average width is about 2,100 feet. Yet with this constant narrowing of the river the volume of water to be discharged is constantly increasing. Hence, it is contended, come those bayous which start out of the river and lead away into the swamps, and down in various directions to the Gulf.

The Numbers of Patents.—The Constitution of the United States went into operation on the 4th of March, 1789, and the first patent law was approved by Washington on the 10th of April, 1790. The patents issued previous to the passage of the law of 1836 were not numbered, but the first patent issued under that law bore date July 28, 1836, and was numbered "one." Since that time the patents have been numbered in succession, reaching now the number of 42,908.

RECENT INVENTIONS.

We copy the following from the *Scientific American* of this city:

MINING.

Smelting Furnace.—This invention consists in the employment for the smelting or reduction of iron, copper, lead, silver, gold, and other metals from their ores, of a crucible, or other vessel, chamber, or receptacle for containing the ore, so placed in a furnace as to be wholly or for the most part surrounded by the fuel, and so provided with openings or perforations that the flame and heated gaseous products of combustion from the fuel are forced into it, upon it, and through the ore. It also consists in the introduction of the blast to the furnace containing such crucible, vessel, chamber, or receptacle, through a grate, or slotted or perforated bed, whereby it is carried upward with an equally distributed pressure upon and among the fuel, and the flame is so forced in jets through the openings of the said crucible, vessel, chamber, or receptacle, that the said openings have the effect of so many tuyeres or blowpipes. The above is the invention of Jonas Winchester, of 36 John street, New York City, and the patent issues to himself and Geo. H. Davies, of Cambridge, Mass., as full assignees. Mr. Davies may also be addressed in relation thereto, at 20 Dey street, New York City.

Melting Furnace.—This invention consists in the employment or use for the purpose of melting metals or other materials, of a crucible with double-arched or double-concave bottom and sides, in such a manner that said bottom and sides are braced every way by the double arch, and the crucible is prevented from cracking or splitting; also in a crucible provided with rounded corners and fitting in a casing with correspondingly concave seats in such a manner that by said seats the crucible is strengthened and the application of a tap-hole to the crucible is rendered practicable; finally, in the use of a double-arched cover fitting on the casing in such a manner that by the two arches the works are strengthened, and it is prevented from cracking or splitting. John Thomson, of New York City, and Thomas Widdowfield, of Brooklyn, N. Y., are the inventors of this improvement.

Stamping Mill.—This invention relates, first, to a certain means employed for taking the powder or dust from the mortar-chamber, and conveying it to the deposit chamber; said means consisting of a blast generated by a fan or an equivalent device arranged in connection with a blast spout, in such a manner that the dust will be taken from the mortar-chamber, and conveyed to the deposit chamber, and the same blast made to act continuously, so as to avoid the admission of fresh external air and the consequent mixing of dirt and other light impurities held in suspension in the external air with the quartz powder or dust. The invention relates, second, to the employment of a valve arranged in connection with the mortar-chamber and blast-spout, in such a manner that, by regulating or adjusting the valve, the quartz may be reduced to a greater or less degree of fineness. The invention relates, third, to an improved mode of securing the dies in the bed of the mortar, whereby said dies are firmly held in position and very readily adjusted in the mortar-bed and detached therefrom. The invention relates, fourth, to an improvement in the construction of the frame of the mortar, whereby the frame is rendered extremely durable and well calculated to resist the jars and concussions caused by the stampers in the prosecution of their work. Zenas Wheeler, of San Francisco, Cal., is the inventor of this improvement.

Blast Furnace.—This invention consists, first, in a blast furnace, the hearth of which, when bisected by a horizontal plane, presents a narrow, long rectangle, the two short sides of which are to be used as working sides, and its two long sides for two or more rows of tuyeres, and whose long and short sides increase gradually from the hearth up to a point near the throat, in such a manner that a perfectly steady and gradual descent of the charges from the throat to the hearth is effected, and the ore, fuel, and fluxes (as charged in horizontal layers) preserve the same relative position toward each other while descending from the throat to the hearth of the furnace; and, furthermore, the reduction of the ore can be effected in less time and with less fuel than it can in a furnace of the ordinary construction; it consists, further, in the employment, in combination with a long, rectangular hearth, of a double row of tuyeres, each tuyere being placed so as to be between two of the opposite sides, in such a manner that a smelting and oxidizing zone of uniform temperature and little vertical depth is obtained throughout the entire length of the furnace, and the process of reducing the ore is effected with less fuel and in less time than in furnaces having the tuyeres arranged in the ordinary manner. It consists, further, in the arrangement of one or more fire-places and fire-flues under the bottom and through the walls of the furnace, in such a manner that a uniform and quick heating of the external walls of the furnace during the erection of the same, and particularly previous to lighting the charge in its interior, can be effected, and thereby the successful working of the furnace is rendered practicable, and its durability considerably increased. It consists, finally, in the employment of slotted air-chambers, in place of or in combination with the tuyeres, in such a manner that the cost of mechanism used for introducing the blast into the furnace is considerably reduced without diminishing or impairing the effect. Woldemar Raschette, of St. Petersburg, Russia, is the inventor of this furnace, and he has assigned it in full to Alex. Trippel, of No. 18 Exchange Place, New York, who is to be addressed for further information.

Roasting and Desulpherizing Ores and Minerals.—Simon Stevens, New York City:

I claim, first, the use of hydro-carbon vapors or gasses as fuel in the roasting and desulphurizing of ores or minerals.

Second, The desulphurizing and roasting of ores by means of a combined blast or current of hydro-carbon vapor, air, and steam, applied in the manner substantially as herein set forth.

Third, The process herein described of separating and collecting the precious metals from pyritous ores, which process consists in roasting and desulphurizing the ore receiving it while hot in water, washing and removing the light earthy matter, and amalgamating the precious metals, these several operations forming a continuous process, as above set forth.

Coal Screen.—John R. Deihm & Jasper Snell, Pottsville, Pa.:

We claim a cylindrical coal-screen, composed of a series of segments, constructed and connected together in a manner substantially as herein set forth.

[This invention consists in constructing the screen of a series of segments composed of longitudinal cast-iron bars connected by transverse wrought-iron rods, the former being cast on the latter so as to obtain a firm connection of the parts, the segments being attached to bands at their ends, all so arranged that a very superior coal-screen is obtained, in consequence of the parts being always retained in proper position, and a free escape allowed for the coal and dirt, while the segments are rendered capable of being curved or bent to suit the required diameter of the screen.]

GAS.

Stop-cock and Case for Pipes leading from Street Mains.—Jas. G. Weldon, Pittsburgh, Pa.:

I claim the within-described stop-cock case and stop-cock, constructed and applied in the manner and for the purpose described, as a new article of manufacture.

PETROLEUM.

Device for Collecting Gases from Petroleum and other Wells.—H. M. Hamilton, Franklin, Pa.:

I claim the application to the pipe or stock, A, of a pump used for pumping petroleum, salt, or other wells, of a chamber, D, with two apertures, a b, one at the bottom to carry off the liquid, and the other at the top to carry off the gases in the manner substantially as herein specified.

[This invention consists in the application to the upper end of the pipe or stock used for pumping petroleum, salt, and other wells, of a chamber or series of chambers with two discharge openings, one at or near the bottom through which the liquids which are brought up from the well descend to be conducted to their appropriate receptacle or tank, and the other opening in the top of said chamber, through which the gases emanating from the well ascend to be conveyed to a tank or other proper vessel, from which they can be drawn and used for fuel or illumination.]

MISCELLANEOUS.

New Motive-Power.—Profs. Barsanti and Matteucci of Florence, have invented a new mode of motive power. Their engine may be described as an atmospheric engine, a vacuum being produced in the cylinders, under the pistons, by the explosion of a mixture of atmospheric air with an inflammable gas. The explosion is said to be without noise, and free from danger. The result of a long series of experiments upon two machines—one of them being of twenty horse-power and the other of four—proves that the consumption of the gas used is one-third of a cubic metre per horse-power per hour. The gas is said to be produced at a cost of less than a penny the cubic metre; consequently, a horse-power can be obtained at about one-third of a penny the hour. The machines constructed are reported to work satisfactorily, and the principle to be equally applicable to marine and locomotive engines. Several patents have been taken out in this country for machines of this class. Hitherto, however, all explosive engines have failed to fulfil the promises of the inventor.—*Athenæum.*

Gold Yield of Australia.—A letter in the London *Star* from Melbourne, Australia, says the yield of gold for the year 1863 has not been quite equal to that of 1862. There is a deficiency in the total yield of 20,000 or 30,000 ounces, but the increase of machinery, and the improved processes for saving gold, promise better for the present year. The deep lodes of Ballarat still prove to be very rich. For an example, the Koh-i-noor Company lately washed out 459 ounces of gold in three days, and declared a dividend of £60 per share for ten days' work. During the year the total clearances of gold amounted to 1,985,501 ounces, of which 1,634,377 ounces were from Victoria, and 364,124 ounces were transhipped from New Zealand. The clearances during 1862 were 2,029,839 ounces—1,711,508 ounces being from Victoria, and 308,331 ounces from New Zealand.

Gunpowder.—Capt. Edward Schultze, of Potsdam, Eng., has invented an improved mode of manufacturing gunpowder. He proposes to take the natural grown-up trunks of trees, clear them from the roots and the bark, and cut these trunks into thin plates of the diameter of the trunks themselves. These timber-plates are cut by machinery into little grains of equal length and breadth with the thickness of the plates. The timber grains so obtained will become the powder grains. The first object of the chemical labor is to obtain the grains as porous as possible, and to clear them from all external mechanical substances. This is obtained by treating the grains with alkalis in a state of boiling heat, and next, to change the incombustible timber grains into flammable, not explosive, grains. This is obtained by the application of chloride, and then of nitrous acid; these grains made explosive by nitric of potash, and in some instances by "kaliferrohydrocy anicum." The proportions are varied, according to the purposes for which the powder is to be used. In case the powder is to have a more gradually acting, not very explosive, force, the first combustible material (namely, the flammable but not explosive grains) will be ground into dust. This dust is then treated by the same process of the above-mentioned mixtures to produce the explosive power. From the matter so obtained a kind of cake of relative strength is produced by means of pressure, and these cakes are the material from which by the necessary machinery the powder grains will be obtained.

Tin Ore.—The San Francisco *Mining Press* says: "Mr. Boyd, of Calaveras County, went to Mexico some time since on a prospecting trip, and writes to some friends in Stockton from the interior of the State of Durango, that he has discovered an exceedingly rich tin mine in that State. He stated that sixty-nine pounds of ore yielded thirty-three and a half pounds of pure tin."

Silver, it is said, has been discovered in the pineries in Burnett County, Wisconsin.

GUN-COTTON.—Professor Abel, who has so carefully investigated the gun-cotton, thus sums up the peculiar properties of this explosive substance:—When inflamed, or raised to a temperature ranging between 137° and 150° centigrade, it burns with a bright flash and a large body of flame, unaccompanied by smoke, and leaves no appreciable residue. It is far more readily inflamed by powerful percussion than gunpowder; the compression of any particular portion of a mass of loose gun-cotton between rigid surfaces will prevent that part from burning when heat is applied. The products of combustion of gun-cotton redden litmus, and contain nitric oxide, hence they have a corrosive action on gun-metal. In the open air it may be inflamed, when in actual contact with gunpowder, without igniting the latter; in a confined space (as in a shell, or the barrel of a gun) the almost instantaneous rapidity of its explosion produces effects which are highly destructive, as compared with those of gunpowder, while the projectile force exerted by it is comparatively small. For these reasons Professor Abel—who is chemist to the War Department—does not think we are yet in a position to use gun-cotton as a substitute for powder.

MECHANISM OF LOCOMOTION.—Prof. Marshall, in a recent lecture on the above subject, before the Royal Institution, London, gave the following as the possible rates of animal locomotion per hour: Shark and salmon, sixteen and seventeen miles; flies, four to six miles; eider duck, ninety miles; hawk, one hundred and fifty miles; worms, thirty feet; race horse, forty to sixty miles; man walking, four to five miles, running twelve to fifteen miles. Especial attention was also directed to the advantage of the atmospheric pressure on the joints, amounting in the knee, where so much flexibility is required, to sixty pounds, and in the hipjoint to twenty-six pounds.

MINING REVIEW.

New York, June 30, 1864.

The market for mining stocks the past two weeks, has been one of extreme dullness. At the regular sessions of the Mining Board in many of the leading stocks, there has not been a single transaction, and it is difficult to get even reliable quotations.

IN COPPERS, the noticeable feature is the large decline in Minnesota, selling as low as 39, and off. at 45. The reason assigned is the large falling off in product, and the probability that the Company will be obliged to pass the next dividend.

Central is quoted lower and dull, owing to the loss by fire of their stamp mill, which will reduce their product for a few months. Isle Royale shows a decline of some 2 per cent. Quiny and Evergreen Bluff strong, at better figures.

Several of the new mines are weak in view of assessments called—payable next month.

The Shelden and Columbian Companies have consolidated on equal terms.

THE GOLD STOCK operations have been limited, and the few sales made are at lower prices than previous quotations.

The stocks of many of those companies which were placed 3 months ago by subscriptions, are now forced on the market by weak holders, without regard to price. The reports from Colorado are generally favorable, still the public seems disposed to sell, and show as little judgment as they did in buying, and prices decline without giving any criterion of relative value.

LEAD STOCKS are heavy and neglected. Clute dull, at a decline of a ¼ per cent. Bucks Companies shows a large falling off, being offered at ⅜; sales at ¼. The mine is said to be looking poorly. The improved appearance noticed some two months since does not continue.

The Placeretia Bay Company have advice of a shipment of 70 tons of ore, and a favorable report on the appearance of the mine.

To show the dullness of the market and absence of speculation, we would call attention to the Quincy Copper Company, producing at this time more copper than any other company in this country. The difference between to-days' price of ingots 50c., and that of last January 40c, will make on this years product (computed by the average of the past four months,) over $250,000, while the price of the stock has advanced only some 2 per cent.

With the present price of copper, many of the mines on Lake Superior must pay largely, and are well worthy the attention of capitalists.

NEW YORK MINING EXCHANGE.

June 30, 1864, 11 *o'clock, A. M.*

COPPER STOCKS.

Astec copper, asked 6⅜; Bedford copper, *a* 2; Boston copper, *b* 5; Calidonia copper, A. P. *a* 14; Canada copper *b* 3½; Carp Lake copper, *a* 5½; Central copper, *b* 60; *a* 64; Clifton copper, *a* 2; Dacotah copper, *a* 5½; Derby copper, *a* 2½; Evergreen Bluff copper, *b* 19; *a* 20; Hamilton copper, *a* 7; Hilton copper, *b* 4; *a* 6; Hudson copper, *a* 2½; Indiana copper *a* 10; Isle Royale copper *b* 21; *a* 22; Keweenaw copper, *a* 6; Knowlton copper, *b* 7; *a* 8½; Lafayette copper, A. P., *a* 2½; Mendota copper, *b* 3; Merrimac copper, *a* 5; Minnesota copper, *b* 38; *a* 45; Norwich copper *a* 8; N. J. Consolidated copper, *a* 4½; Ontonogon copper, *b* 4⅝; *a* 5½; Ogima copper, *a* 9; Penn copper, *a* 11½; Providence copper, *a* 2; Quincy copper, *b* 96; *a* 100; Sharon Consolidated copper, *a* 2⅞.

GOLD STOCKS.

Benton gold, bid 1⅛; asked 1⅞; Connecticut Mining Co., *a* 1½; Corissanie gold, *a* 5⅜; Corydon gold, *a* 3; Gunnell gold, *b* 3½; *a* 4; Isaac's Harbor gold *b* 1; *a* 1⅛; Kipp & Buell gold, *b* 1½; *a* 2½; Mammoth gold, *b* 8; N. Y. and Nova Scotia gold, *b* ⅝; Quartz Hill gold, *b* 13½; *a* 13⅞; Smith and Parmelee gold, *b* 6.

COAL STOCKS.

Cumberland coal, asked 69; Central coal, *a* 73.

LEAD STOCKS.

Bucks County lead, bid ⅝; asked ¾; Clute lead, *b* 1⅝; *a* 1⅞; Erie lead, *a* 20; Macomb lead, *a* 4; Sussex lead, *a* 85c.

IRON STOCKS.

French Creek iron, asked 1⅝; Teal Lake iron, *a* 7.

SALES.

Canada copper, 100, 3½; 300, 3¼; 100, 510 3½.
Placentia Bay lead 1000, 1½.

THE LENOIR GAS ENGINE.

MOTEUR LENOIR.

(*See Engraving on last page.*)

The Gas-Power engine, invented by M. Lenoir, of Paris, is now introduced to the American manufacturers, and public at large. The patent for the United States was secured last Autumn, by a gentleman who found the engines in successful and general use in France, and it is believed that its introduction into this country will be an invaluable boon.

M. Lenoir, after several years of experiment, has brought to perfection his gas-power engine, under the auspices of the Imperial Gas-light Company of Paris, and since its first introduction it has been gradually coming into general use in France, until now the French company have a difficulty in keeping pace with the rapidly increasing demand, arising from the multitudinous uses to which it is found to be applicable.

It has recently been introduced into England by the highly respectable firm of Messrs. BARRETT, EXALL & ANDREWES, proprietors of Katesgrove Iron Works, Reading, whose reputation as engineers and machinists is a sufficient guarantee of their opinion of the excellence of the invention, and its adaptation to the mechanical wants of that country.

In a circular addressed to the British public, these gentlemen say: "With a knowledge of all the facts, we "do not hesitate to lend the sanction of our name to "its introduction as a new motive power, into this coun- "try, as we feel convinced it will have an influence "only less powerful than steam already possesses; we "have, therefore, entered into a legal engagement with "the proprietors of the (British) patent, to undertake "the formation, as early as practicable, of a Joint "Stock Company, under the Limited Liability Act. "Under this agreement we are preparing to undertake "the manufacture of the various sizes, which we hope "to be shortly in a position to offer to supply to the "public."

The LENOIR ENGINE is in appearance and style very much like a horizontal steam-engine, having a cylinder, piston, crank-shaft, and fly-wheel; the cylinder has the necessary slide arrangements for the admission of the gas (the ordinary city coal-gas, supplied from the service-pipes) and atmospheric air, in due proportions, which is ignited at the proper moment by the electric spark from a battery connected by wires to each end of the cylinder—the connection being made and detached by the rotary action of the crank-shaft—the expansive force, consequent on the ignition, gives motion to the piston on each side alternately. The cylinder has a water-jacket surrounding it, through which a stream of water is kept gradually flowing, to keep it cool.

The engine, once fixed, the battery charged, and the gas turned on, it is ready for action at any desired moment, and as soon as the work required of it is completed, and the gas shut off, the engine instantly stops, and, the expense ceases.

The LENOIR ENGINE is elegant in appearance, simple in construction, absolutely free from danger, either from fire or explosion; it is clean, free from heat, smoke, dust, dirt, or noise; its power is constant or intermittent, as desired, and its expense, when once fixed, is co-existent only with its working.

It is not liable to derangement; in wear and tear the cost is reduced to a minimum sum; the daily expense of gas and chemicals is trifling, while there being no boiler and no chimney, there is no fear of giving annoyance to neighbors. The current of water passing round the cylinder will give a constant supply of warm water, if desired, for other purposes.

No engineer is required to look after it. Once set in motion, it may be left for the day without anxiety, as, should it stop from any cause, no injury can ensue; while the gas-cock, being fixed, and the supply thus regulated, it cannot increase its speed.

It can be worked in any apartment, on any floor—in the cellar or garret, in the hall, a closet, or even in a sitting-room—and under almost any circumstances; in fact, it possesses all the elements to render it a most popular motive power.

The difficulty of obtaining steam-power in central parts of cities is obviated by this engine, which can be fixed and removed at pleasure, quickly and at the least expense.

To GAS COMPANIES it presents no inconsiderable advantages, as not only will it prove a large consumer of gas, but it will require it during the day, a time when there is no other consumption going on.

It is found that the consumption of gas in England is, as near as may be, 70 feet (2 French metres) per horse-power *per hour of actual work*, giving a cost there, with gas at 4s. 6d. sterling per 1,000 feet, of about 4d. (8 cents) per hour.

It has been patented in the following countries:

Austria,	France,	Russia,
Belgium,	Holland,	Spain,
Cuba,	Italy,	United States.
England.	Porto Rico,	

The LENOIR ENGINE is not constructed at present for purposes requiring a greater than 5 horse power (the sizes being ½-horse, ¾-horse, 1-horse, 2-horse, 2½-horse, 3-horse, 4 horse, and 5-horse power), and is therefore specially adapted to small industries, such as carpenters, lathe-turning, sewing machines, hoisting apparatus in warehouses, grain elevators, pumping water in private houses, and hotels (by ½-horse engines), and in factories of all kinds, hoisting timber and stone for buildings, by an engine placed on the sidewalk or beams; distilleries; hotels, for lifting passengers and luggage, and moving washing and drying apparatus, as in the Paris hotels; to glass-cutters, gun-smiths, hydraulic pumps, belting, job printing; driving ventilating fans, printing daily newspapers, propelling city railroad cars, and pleasure yachts; cutting tobacco and box-wood; grinding quartz, paints, and sugar cane; picking hair; sawing, turning, and planing lumber; also, for roasting and grinding coffee, chocolate, corn, &c.; ginning cotton, cutting feed, &c., &c., &c.

For the oil wells of Pennsylvania this engine is peculiarly adapted, as the proprietors can make their own gas, at trifling cost, on the spot.

The LENOIR GAS ENGINE is in operation in this city, at the brass-cock manufactory of Mr. A. CARR, No. 135 Mercer street, between Houston and Prince streets, and at the gas stove manufactory of Mr. A. L. BOGART, No. 706 Broadway, above Fourth street, where those interested are invited to call and examine them.

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By W. B. DINSMORE, Prest.

NEW YORK, June, 1864.

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KINSLEY & CO.'S EXPRESS,
By E. LITTLEFIELD, Supt.

HOPE EXPRESS COMPANY,
A. D. HOPE, Supt.

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Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,
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of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.
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Sewer Pipes extensively used in Brooklyn, and now introduced in New York, Jersey City, Newark, Hartford, Albany, and other localities, from 3 to 24 inches in calibre.
Water Pipes, lined and coated with Cement mortar, ready for laying and back filling, and can be tapped like cast-iron pipes, which they excel in durability, discharge, and economy.
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with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
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And every description of
GAS FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
MANUFACTORY,
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New York.

"HER MAJESTY"
CHAMPAGNE.
THE ROYAL WINE OF ENGLAND.
A limited quantity of this delicious and superior Wine has been secured for the undersigned, and the first shipment of 500 cases has arrived this day, by the steamship "Olympus," from Havre.
It comes direct from the cellars of the well-known house of Messrs. DE VENOGE & CO., at Epernay, France, and the present invoice will be introduced into this market at the very low price of
Twenty Dollars per Case of Quarts.
Payable in currency, which is much below its actual first cost.
The superior quality of this Wine is guaranteed, and it is offered with every confidence of its entire approval by connoiseurs, and lovers of a fruity, full-body wine.
Orders for one or more cases may be addressed, by letter or otherwise, to the undersigned,
WM. HENRY WARD,
WINE AND FRUIT DEALER,
Quarts, $20. No. 7 Broad st., near Wall,
Pints, $22. New York.

THE AUBIN
GAS-WORKS COMPANY,
Of Albany, N. Y.,
Now contract their works to make 10,000 feet of good Gas from 2,000 pounds of *hard* wood and 40 gallons of kerosene tar, *before payment can be demanded;* and the charcoal is worth the cost of the wood.
Many Village Gas Companies can be referred to.

D. PARRISH, Jr.,
GAS ENGINEER
And Contractor for Coal or Oil Gas-Works.
Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.
To Manufacturers of Petroleum Gas.
For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.
Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

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OFFICE FOR THE PROCURATION of Letters Patent and the Registration of Designs. JOSEPH WILLCOCK & CO., Patent Agents and Engineers, successors to Messrs. BARLOW & Co., 89 Chancery Lane, London, W. C.
Gratis and post free, "The Inventor's Manual," also a pamphlet, "L'Obtention de Patentes Anglaises," 500 Mechanical Movements; the first part of Kinematics, or the Transformation of Motion, by Joseph Willcock, C. E., Mem. Soc. of Eng. May be had at the above address, and of any bookseller. Price 2s. 6d.
The second part is approaching completion and will shortly be announced.

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For Lighting and Heating Purposes.
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WALSALL, STAFFORDSHIRE, ENGLAND,
ESTABLISHED 1830.
LAMBERT BROTHERS,
MANUFACTURERS OF
Lap-welded Boiler Tubes, Locomotive and Marine Engine Fittings,
PATENT ECONOMIZING
GAS-BURNERS,
Regulated to burn without noise or fluttering at sixth-tenths to eighteen-tenths pressure. Last twenty Scotch tips. Price from 8s. to 40s. per gross; liberal allowance to wholesale buyers. Any size for any gas (coal, wood, or cannel) screw either taper s/3, s/4, or plug.

500 Tons Cast-Iron Water-Pipes Wanted.
OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, Ill., May 25th, 1864.
SEALED PROPOSALS WILL BE received at this office until 11 o'clock, A. M., Saturday, June 4th, for FIVE HUNDRED TONS of 4, 6, and 8 INCH WATER-PIPES, to be delivered at the dock of the Board, in Chicago, on or before October 1st next, according to specification on file in this office, copies of which will be furnished, if desired.
The pipes may be in lengths of 9 feet or 12 feet, but the length of 12 feet will be preferred. For 9-feet pipes the weight will be, respectively, for 4, 6, and 8-inch pipes, 220 lbs., 330 lbs., and 450 lbs., and for 12-feet pipes in proportion.
Bids must be directed to the Board of Public Works, endorsed "Proposal for Water-pipes."
The Board reserves the right to reject any or all bids.
J. G. GINDELE, FRED. LETZ, O. J. ROSE, } Board of Public Works.

H. P. GENGEMBRE'S
PATENT
NON-FREEZING & NON-EVAPORATING FLUID,
For Filling Wet Gas-meters,
AND
Far Cheaper than any other Meter-fluid in use.
WARRANTED
Not to corrode tin, iron, brass, zinc, or drum-metal.
To be less injurious to wet meters that water.
Not to freeze at 20 degrees below zero, Fah.
Not to evaporate when in use in the meters, meters once filled with it requiring no further attention whatever for years.
The summer is the proper time to fill them.
SIX YEARS OF SUCCESS!
Five years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend our patent with perfect confidence.
For information and references, apply to
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THE GAS-POWER ENGINE,
MOTEUR LENOIR.

Messrs. BARRETT, EXALL & ANDREWES

Having made arrangements with the proprietors of the above valuable Patent, on terms which must command its introduction into Great Britain and her colonial dependencies, are desirous of at once arranging for the formation of a Company under the Limited Liability Act.

Believing that the value of the Patent to Gas Companies cannot be over estimated, and that it is destined to occupy a s phere in powers which, though enormously extensive, have never yet been worked; and believing also that the Gas Companies should have the first opportunity of possessing it, Messrs. B. E. and A. will be happy to receive any communications with a view to tha result before they introduce it to the public.

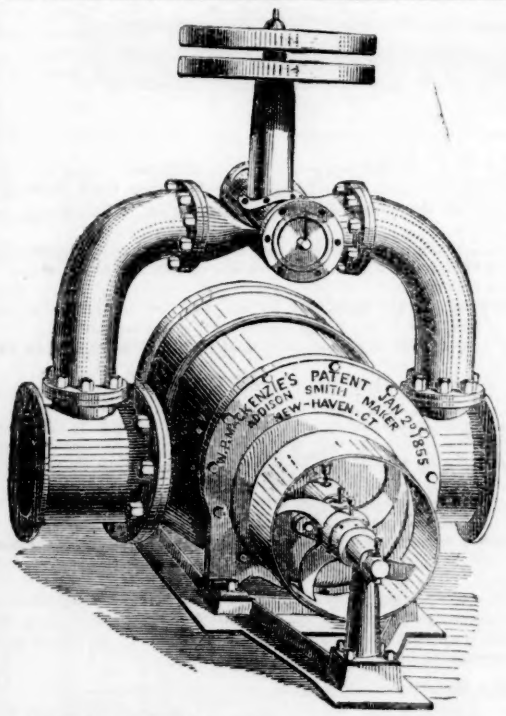
The manufacture will be at once commenced with the 3, 2, 1, and ½ horse powers. They are in form like a horizontal steam engine; require no boiler, chimney, or expensive setting; are elegant in appearance, perfectly clean, free from smell, and can be set to work at a minute's notice—the cost ceasing when they are at rest.

THEY ARE ABSOLUTELY FREE FROM DANGER,

either from explosion or fire, and require the minimum of attention.

Address as above, at

Kate's Grove Iron Works, Reading, England.



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Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER

AND

PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE, 458 Broadway, New York.

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Continue, as heretofore, at their old Establishment,

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WET AND DRY GAS METERS (Consumers'),
STATION, EXPERIMENTAL AND SHOW METERS,
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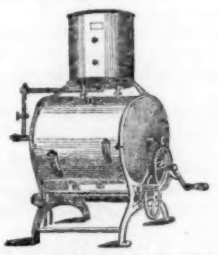
DRAKE'S
PATENT
AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient,
Simple, and
Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

These Machines are manufactured in Boston, by the AUTOMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington street, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broadway, New York.

For further particulars, address—

MITCHELL, VANCE & CO.,
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PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

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NEWSPAPER WRAPPERS. Mara's Patent Self-Sealing and Folding Water-lined Newspaper Wrappers. Manufactured only by

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Envelope Manufacturer,
No. 77 White st., near Broadway, N. Y.
And sold by all booksellers in the United State

ROBBINS' PATENT GAS AND WATER JOINT.

THE PROPRIETORS of this unrivalled joint are now prepared to introduce it to general use, and to guarantee that, in all respects, it will fulfil perfectly all the requirements of either water, gas, or steam. It is a joint which remains in all situations absolutely tight.

The following illustrations, with the appended explanations, will give a good idea of the improvement:

Fig. 3.

Fig. 1.

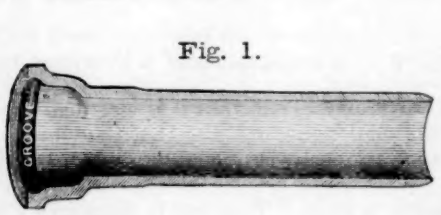


Fig. 2.

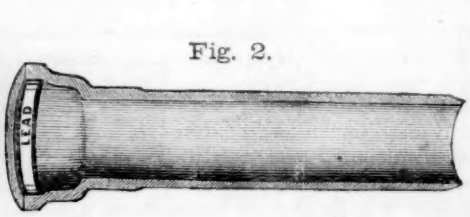


Fig. 4.

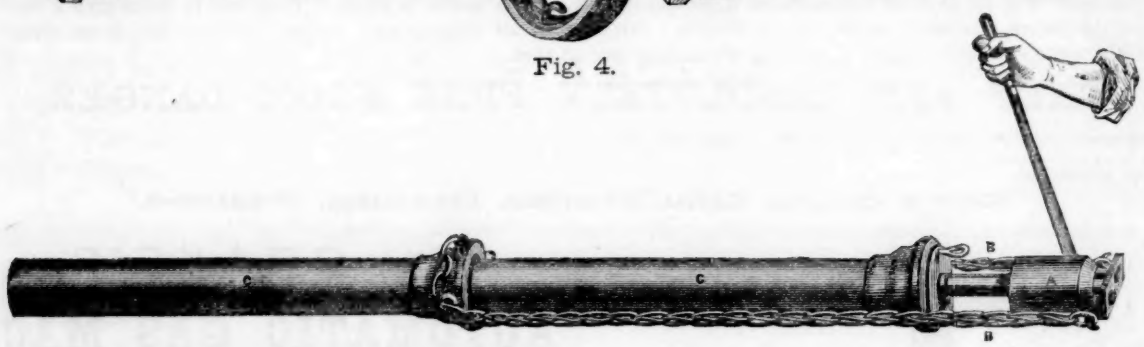


FIG. 1. Is a sectional view of a pipe showing a groove to receive a lead ring.

FIG. 2. Is a sectional view of a pipe showing a lead ring in the groove.

FIG. 3. Represents a former, which is used in the bell end of the pipe while casting the lead ring. Before using the former, however, a strip or belt of India rubber is first inserted in the socket, against which the former rests to prevent the lead escaping from the groove while being cast. Upon the cooling of the lead, the former and rubber ring are withdrawn from the socket, and the lead ring is left projecting inwards from the groove all around, forming an indestructible packing to receive the spigot-end of the pipe.

FIG. 4. Shows two pieces of pipe in connection with an hydraulic jack, by which the spigot-end of the pipe (which is cast tapering and may be cast in a chill), is forced into the lead ring in the groove which perfects the joint. A, represents the jack; B, B, the chains by which the pipes are drawn together; and C, C, pieces of pipe.

This ring joint packing may be cast at the foundry or any convenient place, and when delivered at the ditch, may be laid, and perfect joints formed, by any laborer, above or below the surface, or in ditches filled with water, there being *no joint ditching required*, and it can be laid with very great rapidity.

Among the economies realized by this joint may be enumerated, the saving in the weight of the pipe, in the amount of lead required to be used in forming the packing, in the labor of ditching, and in laying the pipe.

The bell or socket may be cast one-half the usual length, as the width of the groove requires, but from a half to one and a half inches, according to the size of the pipe, thus saving in the total weight about two hundred pounds per ton.

The weight of lead required to form this joint, as compared with the amount of lead used in forming a joint according to the old method, is fully seventy-five per cent. less, only so much being required as to maintain the compensating principle, or enough to allow (upon the raising or depressing of the line of pipe out of a direct line) what is lost upon one side of the ring packing, to take its place upon the other; thus securing flexibility of the joint without affecting its reliability. The use of yarn or hemp packing is dispensed with, the cost of which is an entire saving as compared with the old method of making joints.

The saving of labor in ditching is the total amount usually expended in digging joint-holes, there being *no joints to be caulked.*

The saving in labor in laying pipe furnished with this joint is a sum equal to the whole cost of carrying lead, fuel, ladles to the ditches, casting the lead, bailing out water, and the entire labor of caulking, less only the sum charged for casting the lead ring packing at the foundry, which is comparatively trifling. This last-mentioned economy has been estimated by the best engineers at seventy-five per cent., or the same as the saving in the quantity of lead used.

The cost of pipe cast from our patterns is the same per ton as pipe cast for the old form of joint. The principal iron-founders propose to charge the same price.

We have submitted these joints in water-pipes to a pressure of two hundred and fifty pounds to the square inch, and they have remained perfectly tight. It has also been submitted for months in gas-pipes to the ordinary pressure of our city gas-mains, without any leakage whatever. We are aware that these statements may be deemed by many extravagant, but the merits of the improvement warrant them all, and the most skeptical may be fully convinced by an investigation of its value, and by witnessing the tests to which we submit it, or by its use under any conceivable circumstances.

TESTIMONIALS.

OFFICE OF THE WATER COMMISSIONERS,
CITY HALL, JERSEY CITY, October 14th, 1863.

Dear Sir,—On the 26th of May last, about two hundred and sixty feet of cast-iron water-pipes, six inches in diameter, with joints constructed according to your invention, were laid for the Jersey City Water-Works, in Prospect street.

The operation of uniting the joints of the pipes, was performed with remarkable facility, and with an important saving in time, materials, and labor. The joints proved perfectly water-tight, after turning the full head of water on the pipes.

In my opinion, your invention has proved entirely successful, and will be found highly beneficial to water companies.

Yours, respectfully,
ROBT. C. BACOT,
Superintendent and Engineer, Jersey City Water-Works.

MR. R. C. ROBBINS.

ENGINEER'S OFFICE, CROTON AQUEDUCT DEPARTMENT.

Dear Sir,—I have examined your plan for making joints in cast-iron water pipes, and have a report from one of my assistants, of certain experiments made by you, to prove the certainty and economy with which the joints can be made, and their stability when finished.

I think the experiments showed that the joints could be made quite as rapidly, if not more rapidly, than those made in the ordinary method now in use; the quantity of lead used was less than that required in the common joint, and no yarn packing was required. In these respects, your joint seems superior.

After the joints were made, a pressure of three hundred pounds to the square inch, was put upon the pipe in such a manner as to test the efficiency of the joint to prevent both leakage of water, and separation of the pipes from each other longitudinally. This pressure failed to produce either leakage at the joint, or separation, so long as the pipes lay in a direct line; but on deflecting them six and a half inches, in a length of twelve feet, the joint commenced leaking. It is fair to add, that this is a greater deflection than would often be found necessary in laying pipe.

I think the efficiency of the joint in both the points tested in this last experiment, might be increased by increasing the quantity of lead, both in thickness and width.

Altogether, the result of the experiments was such that I have determined to make a more thorough test of your invention by putting down about one thousand feet of pipe, when we commence our operations for the coming season.

The diameter of the pipe subjected to experiment, was six inches, and is the same size that I propose to put down next year.

I am, very respectfully, your obedient servant,
A. W. CRAVEN, Chief Engineer, &c.

To R. C. ROBBINS, Esq., Jersey City.

METROPOLITAN GAS-WORKS,
ENGINEER'S OFFICE, NEW YORK, October 9th, 1863.

Dear Sir,—The undersigned had the pleasure of being present at an experimental test of your patent joint for gas and water pipe, made at the yard of the Croton Aqueduct Department, and cheerfully testify to the results obtained, namely:

First experiment was made with two lengths of eight-inch pipe, jointed together, when a pressure of three hundred pounds to the square inch was applied. This pressure did not force the pipe apart, nor start the joints, but they remained, during this experiment, perfectly tight.

Second experiment was made by deflecting the pipe five inches, which is about equal to eighteen inches in one hundred feet, and the same pressure applied, which caused a small leak at the joints.

Third experiment was made by taking the pipes apart and rejointing them, when the same pressure was applied when lying straight and when deflected; at this experiment there was no leakage.

From these severe tests it is my impression that the superiority of your patent joint has been made manifest, and that it must eventually supersede the old way of jointing pipes together, saving both time and material.

Wishing you success in your enterprise,

I am, very respectfully, yours, &c.,
AMBROSE J. WHITE, Engineer.

To R. C. ROBBINS, Esq.

OFFICE OF THE METROPOLITAN GAS-LIGHT COMPANY,
NEW YORK, October 9th, 1863.

Dear Sir,—Having been present at the testing of your patent joint for gas and water pipe, at the yard of the Croton Aqueduct Department, I can testify to the results as stated by Col. A. J. White and fully concur with him in the opinion expressed in his letter to you of this date.

Very respectfully, yours,
W. TITUS, Secretary.

R. C. ROBBINS, Esq.

NEW YORK, October 23d, 1863.

Gentlemen,—I am pleased to be able to inform you, that we are fully satisfied that we have done well in adopting your "Improved Joint," in the construction of an aqueduct which we are now building on Oil Creek, Northwestern Pennsylvania.

We have ten miles of three and four inch pipe to lay this season, and, in our estimation, the perfection of the joint, economy in lead, and rapidity with which the pipe can be laid, render it entirely preferable to any other method of laying pipe.

Our Mr. Hutchings advises us that he is putting down the three and four inch pipe at the rate of twenty-five to thirty lengths per hour, with two men in the trench. We are much pleased with this result.

Respectfully yours,
HUTCHINGS & FOSTER.

Messrs. R. C. ROBBINS & Co.

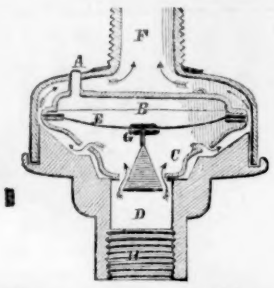
For further information, or for prices and terms, which will be very reasonable, apply to

R. C. ROBBINS & CO.,
No. 218 FULTON STREET, NEW YORK.

THOMPSON'S

PATENT

AUTOMATIC GAS CONTROLLER.



Notice to Gas Companies and Consumers of Gas generally.

WE RESPECTFULLY INVITE YOUR ATTENTION TO THE FOLLOWING TRUTHFUL DESCRIPTION OF THE construction and operation of this recent and most important invention; its application to every street lamp, and on the fixtures within the works of the Gas Companies, as well as for the use of the general consumer, will be found to effect perfectly and reliably, the object so long sought for, viz.: **a perfect control of the Gas under varying pressures, emitting the Gas at the burner without force, and without increase or diminution of quantity, and hence promoting the highest possible illuminating power of the Gas.**

THE AUTOMATIC GAS CONTROLLER

Is designed to occupy the place of the gas-burner. Within the circumference of a small cylinder, below the burner, is placed a conical valve, attached to a movable diaphragm, the valve and valve seat is proportioned, so that under a supply of Gas, varying in pressure from four-tenths to five inches, the burner will continue to produce the same consumption and development. The unerring accuracy of movement of the Diaphragm at every change of pressure, whether gradual or sudden, and its positive control of the valve which admits, by its proportionate increased or diminished aperture, the same unvarying amount of Gas, has elicited the unqualified approbation of engineers and other experts in the profession.

The simplicity of its construction, and materials used, are a sure guarantee of its durability and continued successful peration. They afford to the consumer of Gas the advantage of a **superior light, with the greatest possible economy**; and for the Gas Company, they control the Street Lamps, affording a more satisfactory light for the public, without waste.

The public are invited to witness its operation, at the Office of the Company; and samples will be sent to Gas Companies for experiment, on applicatiou by letter or otherwise.

G. W. THOMPSON & CO.,

Office, 52 GREENE ST., (up stairs.)

A. L. BOGART, AGENT, 592 BROADWAY,

New York.

We are permitted to refer to the following Gentlemen, who have thoroughly examined our Gas Controller:

GEO. H. KITCHEN, Inspector of Gas Meters, 561 Broadway.
CHAS. ROOME, President Manhattan Gas Company.
J. H. ADAM, President New York Gas Company.
PETER COOPER, Cooper Institute.
JOHN A. DUFF, Olympic Theatre.

THE AMERICAN METER CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS and REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy, and excellence of workmanship. Orders addressed

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1 BARRETT STREET, BOSTON, will meet with prompt attention.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

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WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

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GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches.

561 Broadway,
NEW YORK.

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works,
417 Walnut st., Philadelphia.

ANALYTICAL CHEMIST

C. ELTON BUCK,

Analytical and Consulting CHEMIST,

39 NASSAU STREET, NEW YORK,

Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

GLYCERIN

FOR

Filling Wet Gas-Meters,

Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and oke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.

Office 64 Sycamore.

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

WOODEN PURIFYING TRAYS.

PATENT

Conically Slotted Solid Wood Sieves

FOR GAS PURIFIERS.

CAUTION

TO

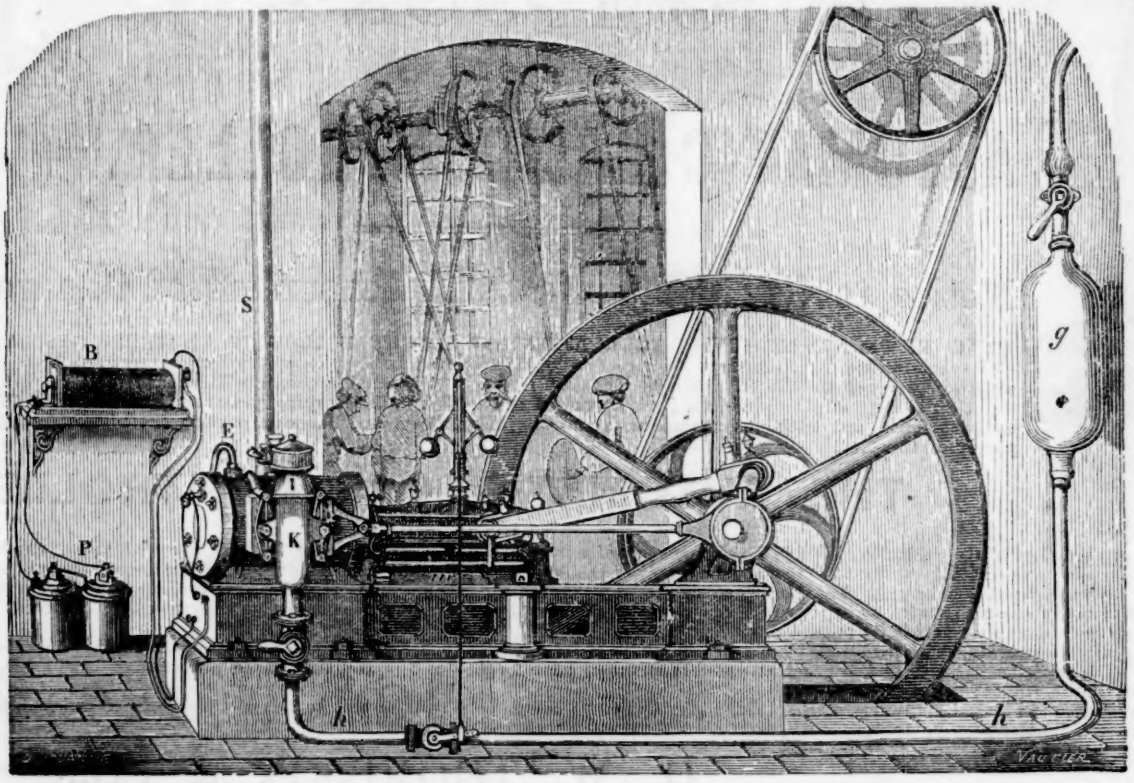
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago.
Louisville,
And numerous others.

Orders received by mail or otherwise.

JOHN L. CHEESMAN,
147 Ave. C, New York City.



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters by a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two-and-a-half horse Engine is now in practical operation at the brass cock manufactory of Mr. A. Carr, *No.* 135 *Mercer Street, between Prince and Houston Streets,* and a half-horse engine at the gas stove manufactory of Mr. A. L. Bogart, *No.* 706 *Broadway, above Fourth street, New York,* where those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.

☞ *See full description on first page of this number.*